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I.—*Memoir on Chinese Tartary and Khoten. By W. H. WATHEN, Esq., Persian Secretary to the Bombay Government.*

[*Extract of a letter to the Sec. As. Soc. read at the Meeting of the 2nd inst.*]

Having had opportunities of conversing with many natives of Chinese Tartary, several of whom were intelligent and well-informed men, I have drawn up a description of the country, from the information I obtained from them; and, as in the absence of any more correct accounts of a region which has not been visited since the time of GENGHIZ KHA'N and his successors, this may prove interesting, I transmit the memoir to you, to be laid before the Society.

I am well aware of the great caution with which oral information on such points should be received. The accounts I obtained were not elicited by any formal queries, or by giving the persons addressed any idea of the object in view; but in the course of daily interviews, and by friendly intercourse with them; and all my questions were casually introduced in the course of desultory conversation.

I have been on friendly terms with at least ten of these persons, who were on their way to perform pilgrimage at Mecca; and where I had any doubts regarding the authenticity of information received from one, I took advantage, on a different occasion, to address myself, on the same subject, to another, and thus an opportunity was afforded to rectify any thing which might have been incorrectly stated.

My sole object has been to add, in any degree, however trifling, to our knowledge of a country so near our own frontier, and of which, at present, so little is known; and I trust I shall be excused, at least, in my humble attempt to imitate those great men MM. HUMBOLDT and KLAPROTH, who have been gaining information, in precisely the same manner, from natives of Chinese Tartary, who have resorted to Orenburg, or Orsk, on commercial pursuits, the result of which they have lately published at Paris.—W. H. W.

Chinese Tartary.—The province of Chinese Tartary contains, at present, nine towns of considerable magnitude, namely, *Yárkand*, *Kashgar*, *Auksú*, *Eela*, *Yengí Hissár*, *Ooch Túrján*, and *Koneh Túrján*, (which is sometimes called *Hami*), *Gúmí*, and *Lopp*.

Yárkand.—Of these, *Yárkand*, from the extent of its population, may be said to be the capital of the province, though, in a political point of view, each of the governors and Chinese residents of those towns exercises independent authority. *Yárkand* is described as being a flourishing and populous city. It has two forts: the principal one is of large extent, but its walls are of clay; and it is uninhabited; the other, which is rather smaller, has four gates, is inhabited, and is considered by the natives as very strong, being built of stone and chunam, and surrounded with a ditch. The suburbs extend over a considerable space. The population of *Yárkand* is said to consist of about 30,000 families, as found by a census made by the Chinese—each family consisting of from five to 10 persons. Only 200 Chinese merchants are fixed residents; but many other traders of the same nation resort to the city—departing after a temporary stay. There are also many *Túnganí* merchants resident in the place, and a number of Chinese artisans. Many natives of *Kashmír* have settled at *Yárkand*, a very few Hindus, and some *Shíahs*, or, as they are called, worshippers of *Alí*; but no Jews or *Nogai Tartars*. The houses are generally one story high, and built of clay, which answers the purpose sufficiently well, as very little rain falls in these countries. *Yárkand* boasts of numerous mosques and colleges. There are two spacious bazars—one within the fort, and the other in the suburbs, besides other smaller bazars in different quarters of the city. Horse-flesh is sold in the butcher's shops, and generally eaten: it is not considered unlawful food by the people of the country, and generally sells for the same price as mutton. *Kim-miz* is not used by the inhabitants of the towns, but by the *Kalmuks*, and other roving tribes. The tenets of the *Musalmán* religion do not appear to be very strictly observed in Chinese Tartary; and the inhabitants seem to be much more tolerant than those of *Kokan*, and other places in Independent Tartary.

The Chinese government has a force stationed at *Yárkand*, stated to consist of about 7000 soldiers, partly Chinese, and partly *Mandshus*, or *Mongols*, of whom a portion garrison the forts; the remainder are cantoned outside the town, much like the English troops in India. The whole are under the orders of an officer, who has the title of *Umbaun*. There are no *Túnganí* soldiers in Chinese Tartary; for, as they are *Musalmans*, the Chinese fear that they would,

being of the same religion, join the Usbeks in case of any insurrection taking place. The *Túngánís* live in the country, the chief towns of which are *Salar* and *Seirum*. ALEXANDER the GREAT is said to have penetrated as far as *Salar*, and to have left a colony of his soldiers in the country, from whom the *Túngánís* are descended. They derive the name from several Turkish and Persian words, in different ways, signifying, left behind, looking back, &c. &c. It is a general tradition, that ALEXANDER carried his conquests through this country, to the frontiers of China proper. The Umbaun, who is the Chinese resident, is the chief political, as well as military, authority in each district. The present Governor of *Yárkand* is ABDUL REHMÁN BEG WAUG, who is the nominal Usbek ruler of the country; but is, to all intents, under the most complete control of the Umbaun, who has sole authority over the regular Chinese troops stationed in the district.

There are many small towns and villages dependent on *Yárkand*. The whole district round it is said to be most populous, and is thickly interspersed with villages and hamlets. The country is described as very fertile also; and amongst its productions are enumerated wheat, barley, rice, gram, *jawárl*, *bajrl*, and various seeds from which oil is extracted. Melons, grapes, apples, and other fruits of temperate climes, are also abundant. A large portion, however, of the wealth of the people of the country about *Yárkand* is said to consist of flocks of the shawl goat, called by them *Akhchahs*, of which almost every landed proprietor possesses a large number. The *dúmba*, or fat-tailed sheep, is also common. Plantations of mulberry trees are very numerous, and great quantities of silk are produced.

Irrigation is said to be carried on to a great extent, the whole of the lands in the vicinity being plentifully watered by rivulets, and streams of water, flowing from the mountains.

Kashgar.—The city of *Kashgar* is the ancient capital of the province; but since the rebellion of ЖЕҢАҢГІР КНОҢЕН, when its inhabitants suffered much from both friends and foes, it has fallen greatly to decay. *Kashgar* is the frontier station, and five days' journey from *Yárkand*; with a *káfila* it is six days; but with quick travelling the distance may be traversed in four. The city itself contains about 16,000 inhabitants: many towns, villages, and castles are also dependant on it, the population of which is very considerable. The Usbeck chief of *Kashgar* is named TAHÍ'RULDI'N BEG, who has not the title of WAUG; but his government is distinct from that of ABDUL REHMÁN BEG WAUG, the chief of *Yárkand*. He is, however, inferior in rank to the WAUG. Eight thousand Chinese regular troops are constantly cantoned at *Kashgar*, as a check on the Khán of *Kokán*.

Yengí Hissar.—On the road, about half-way between *Yárkand* and *Kashgar*, lies the town of *Yengí Hissar*, which is famous for its dancing girls and musicians, who are Musalmans, and resemble those of India.

Auksú.—*Auksú* is north-east from *Yárkand*, and distant about 20 days' caravan travelling. This town is represented as a very flourishing place, and a great commercial mart for the products of China and Russian Tartary. It is the residence of a *kákim*, named AHMED, son of OZAK, whose authority is distinct from that of the other chiefs. He is an *Usbek*, and lower in rank than the WANG of *Yárkand*; and, in like manner, subordinate to the Chinese Umbaun. The number of Chinese troops in *Auksú* is 2000. The silver coin called *Tankeh*, the current money of the province, is struck at this place.

Eela, or *Gouldja*.—The town of *Eela*, which is also called *Gouldja*, is situated north of *Auksú*, distant 25 or 30 days' journey; but it may be reached in 20 by quick travelling. From *Yárkand* to *Eela*, the distance is greater, and ordinarily, a journey of 40 days. To this place, as also to *Yessik* and *Kouché*, the Emperor of China banishes criminals of magnitude, for three, five, seven years, or for life. Owing to the fertility of the surrounding country, fruit and grain are very cheap at *Eela*; and good horses, sheep, and dúbas, may be had at very moderate prices. It is at this place, and the neighbouring country, that great numbers of the *Kalmuks*, or *Eleuth* hordes, have been located by the Chinese government. The climate is said generally to prove fatal to foreigners.

Kouché.—*Kouché* is situated north-west of *Auksú*, and south of *Eela*, at a distance of 40 days' journey from *Yárkand*, and about three months' journey from the Russian frontier. The population of *Kouché* consists chiefly of *Kalmuks*. The principal people of substance reside in the city, and the poorer classes in tents on the plains. These generally follow pastoral pursuits, and have numerous herds of cattle.

Ooch Túrfán and *Koneh Túrfán*.—There are two towns called *Túrfán*: one *Ooch Túrfán*, which is only two days' journey from *Yárkand* and *Auksú*; the other *Koneh Túrfán*, called also *Hami*, which is at a distance of two months journey from those places. *Koneh Túrfán* is a very ancient city; and remarkable for the fine grapes which are there produced.

Lopp.—*Lopp* is situated at a great distance from *Yárkand*. The inhabitants are principally Chinese; but few *Usbeks* reside there. *Lopp* is remarkable for a salt-water lake in its vicinity.

Gúmmí.—Between *Yárkand* and *Eelchí* (in *Khoten*) is the town of *Gúmmí*, the chief of which some time since was KURBÁN BEG, who was said to be in possession of the stone called "*Yedeh Tásh*," (rain-stone,) which, according to popular belief, possesses the extraordinary virtue of causing rain to fall, whenever it is placed in sweet water.

Khoten.—In the country of *Khoten* are the towns of *Karakash*, *Eelchí*, and *Kirrea*, besides many others of less magnitude. *Eelchí* was anciently called *Khoten*, but at present there is no town bearing that name, which is now applied to the whole district, of which *Karakash* is the capital; distant about ten or twelve days' journey from *Yárkand*. The district is governed by two Chinese Umbauns, or residents, to whom are subordinate two *Usbek hákims*; one in *Eelchí*, and the other in *Kirrea*. There is a Chinese regular force of 2000 men stationed in the district; and the number of subjects paying tribute is estimated at 700,000. The population is chiefly *Usbek*; but *Kalmuks*, or *Eleuths*, are also settled in large numbers in different parts of the country. The *Musalmans* are more numerous than the *Buddhist idolators*. The policy of the Chinese is said to be opposed to the adoption, by any of their nation, of the *Muhammedan faith*.

Eelchí.—*Eelchí* is 12 days' journey from *Yárkand*. In this town, and generally in *Khoten*, there are many *Baudh* priests and temples.

Kirrea.—*Kirrea* is five days' journey on horseback from *Eelchí*. At this town is a gold mine; the sand of the river which flows near it is also found to contain that precious metal. Two or three hundred labourers are always employed in the mines, which are said to be very productive. The produce of this mine is monopolized by the Chinese government.

Revenue and Trade.—The revenues of *Khoten* are said to exceed those of *Yárkand*. A considerable trade is carried on between these places by *káfilas*, which carry mushroom, satin paper, gold dust, silk, grapes, raisins, and other commodities, to *Yárkand*; whence they bring copper pots, leather, boots, &c. to *Khoten*.

Trade of Chinese Tartary.—A very extensive commercial intercourse is also carried on between *Yárkand* and the large towns near it, as well as with *Kashmír*, *Badakshán*, *China*, and the *Russian territories* on the north-western borders of the Chinese empire.

From *Kashmír* the natives of that country bring to *Yárkand*, shawls, *kincábs*, *chikun*, white piece goods, and leather; and take back *ambú*, or pure silver, the wool of the shawl goat, called *tibbít*, and other articles.

The merchants of *Fyzábád*, which is the capital of *Badakshán*, bring to *Yárkand* slaves, and precious stones, taking back silver and tea. The *káfila*, which comes once a year, is generally about 40 days on the road; but by forced marches, the journey may be performed in twenty.

From *Andejan*, in the Khánate of *Kokan*, piece goods and other commodities are brought viâ *Kashgar*; the return trade from whence consists of pure silver, China-ware, tea, in boxes and bricks. The brick tea is of a very inferior quality, and is used only by the poorer classes. This trade is carried on by means of horses, mules, and camels.

Káfilas come from the Russian frontier, by way of *Eela*, *Auksú*, and *Kouché*, bringing broad cloth, brocades, silver, gold ducats, copper, steel, furs, &c. and they take back tea, rhubarb, sal-ammoniac, &c.

Communication with Pekin.—From *Yárkand* it takes a caravan from four to six months to travel to *Pekin*, (which the natives call *Pechín*;) but by quick marches, the journey may be performed in three months. There is but one road to *Pekin*, which caravans, or travellers, can use; for though there is said to be another, and shorter, route, its use is prohibited by the Chinese government. In the way there is one very difficult pass, where 20 matchlock men may oppose a whole army. A party of *Usbeks* is stationed there. At every stage is a Chinese *Ortung*, or post, of seven or eight Chinese, and about 20 *Usbeks*. No passport is necessary for persons going from *Yárkand* to China; neither are they prevented from remaining there as long as they choose, the leave of the Emperor not being requisite for this purpose.

An extensive trade is carried on between China and *Yárkand*. Great quantities of silk, great numbers of cattle, &c. are taken to China; articles of China manufacture, porcelain, and especially tea, form the returns.

Road to Tibet.—From *Yárkand* to *Ladák*, (or little *Tibet*,) which is nominally dependent on China, is a journey of 30 or 40 days. The country on the way is inhabited for two stages, where Chinese *Ortungs* are met with, five Chinese and 20 *Usbeks* in each; but for the next twenty days, the country passed through is a succession of plains and mountains, without inhabitants. The people at the *Ortung* inspect the passes given by the *Umbaun*, and after stamping it with their seals, return it; but it is kept at the last post, and given back on the return of the party, which must account for absentees. These *Ortungs*, however, it is said, may be easily avoided. By forced

marches, *Tibet* may be reached from *Yárkand* in 17 or 18 days. Thence to *Kashmír*, it takes a *káfila* 25 days; but the journey, by quick marches, may be performed in 15; there is plenty of wood, water, and forage, on the road.

To Auksú.—From *Yárkand* to *Auksú* is 20 days travelling by caravan: and on the way are 17 *Ortungs*, at most of which there are seven Chinese and 13 *Usbeks*; but at some, there are more. The road passes through a very woody country.

Rivers.—There is a river near *Yárkand*, the name of which is *Zurufshan*. It is generally frozen for three months in the winter; when horses, camels, and men may pass over it. From the part of the country about *Auksú* two streams join the *Zurufshan*: one of them flows five *kos* distant from *Auksú*, and the other is seven days' journey from that place.

Climate.—In the summer, when the melons ripen, it is very hot in these countries; but during winter, it is extremely cold. In this season, a great deal of snow falls on the mountains, which are twenty days' journey from *Yárkand*; but in the city itself, very little falls. It rains very rarely, only twice or thrice in the year, for an hour or so; and then the weather becomes very cold.

Volcanoes—Sal-Ammoniac.—At the distance of 10 days' journey from *Auksú*, are two very high ranges of mountains, between which there is a valley, the surface of which, to a considerable depth, is covered with sal-ammoniac. There is a dreadful heat at this place, occasioned by a volcano, which, by the people of the country, is called "God's fire." The heat prevents them approaching it in the summer. During the eruptions, the sal-ammoniac is said to be thrown out, and showered over the valley, like mist, to the distance of one *kos*; it afterwards hardens, and becomes, during the winter, crystallized like ice. People go there in that season, cut it into convenient pieces, and carry it away. It is said, that near old, or *Koneh*, *Túrfán*, also, is a mountain, out of which flames of fire are seen to issue.

Earthquakes—Cholera.—The natives state, that about three years ago, there were constant earthquakes in the province; and that the cholera committed great ravages at *Yárkand*. In *Badakshán*, the earthquakes destroyed a great number of houses and people.

History of the Province.—About eighty years ago, the whole of the country was in the hands of the *Kalmuks*, or *Eleuths*; and there was one *Túra*, or chief, in each district, as governor. The *Kalmuks* were subsequently conquered by the Chinese in the reign of *Kien Lung*, and the authority of the Emperor was established over the whole province. For a long period after that event, the Chinese

held it in possession, without any attempt being made, either by the Kalmuks to regain their lost authority, or by the natives, to assert their independence. Subsequently, however, the Chinese began to oppress the people to such a degree, as to excite much discontent, and a general feeling of dislike towards them. Taking advantage of this state of things, АІ KHOJEH, a descendent of the ancient princes of the country, and a Syed of noble family, to whom the Kalmuks, as well as the whole of the Muhammedan population, were much attached, headed a rebellion against the Chinese, and opposed them with various success for some time ; but was, at length, forced to retire before their superior number. The Chinese are said to have made a cruel use of the advantage they had gained, and massacred the Muhammedans in every quarter where the least resistance was apprehended.

АІ KHOJEH, and his followers, finding it impossible to continue the contest, fled to *Badukshán* ; but the prince of that country betrayed him, and gave him up to the Chinese, who put him to death. In retribution for this treachery, his country, the people of *Yúrkand* believe, has been visited with the miseries that have since befallen it, and fell an easy prey to MUHAMMED MURÁD BEG, of *Kundúz*, who some years ago invaded and conquered it. When АІ KHOJEH was thus delivered into the hands of the Chinese, his son, and his grandson, JEHÁNGÍR KHOJEH, fled to *Andeján*. Some years afterwards, АІ KHOJEH'S son died, leaving his son JEHÁNGÍR KHOJEH, then a youth, under the care of the KHÁN of *Kokan*. About 10 or 11 years ago, observing how unpopular the Chinese had become, he formed a plan for regaining the possessions of his forefathers. Having succeeded in bringing over to his cause EESÁ BAHÁDUR, one of the influential men of *Andeján*, who joined him with a large body of the Khirgiz, and being supported also in his attempt by the KHÁN of *Kokan*, who sent a force of about 8000 horse to assist him ; he advanced into Chinese Tartary, and attacked the Chinese in their cantonment at *Kashgar*. The Chinese, and YUNIS WAUG, who was then the Uzbek hákim of *Kashgar*, took refuge in the fort ; but the Chinese apprehending that this chief and the Muhammedans would join JEHÁNGÍR, put YUNIS WAUG, and many of the inhabitants, to death. This inhuman proceeding, however, failed of its object ; for it did not deter the rest of the inhabitants, who were Musalmans, from going over to JEHÁNGÍR ; who, thus strengthened, attacked the fort, and carried it by storm : the Chinese, who were taken by surprise, being either driven out, or cut to pieces.

JEHÁNGÍR KHOJEH then marched to *Yárkand*, where also he was well received by the inhabitants. The Chinese, after sustaining several defeats, abandoned the country. Encouraged by his success, the KHOJEH then proceeded to *Khoten*, and expelled the Chinese from that province. Whenever he made his appearance, the Chinese either gave way, or, resisting, were put to the sword. Thus JEHÁNGÍR acquired possession of the whole country, which remained in his hands for five or six months; but, abusing his power, he tyrannised over the people, and oppressed them. He became, in consequence, disliked, and was not supported by the inhabitants in opposing the Chinese, who returned with an army estimated at about 60,000 men, besides many Kalmuk horse. Being unable to check their progress, the KHOJEH retired to the mountains, and his *Khirgiz* and *Andeján* allies retired to their own countries, carrying away with them property of immense value, of which, on the approach of the Chinese, they had plundered the inhabitants. Shortly afterwards, ISHÁK KHOJEH, of *Kashgar*, being jealous of JEHÁNGÍR, betrayed him into the hands of the Chinese general at *Auksú*, by whom he was sent to *Pechín*, (*Pekin*,) where he was put to death by order of the Emperor. For the service which ISHÁK KHOJEH had rendered, he received from the Chinese, the office and title of WAUG, or prince of *Kashgar*. The real cause of the defeat of JEHÁNGÍR KHOJEH was, that the Usbeks of Chinese Tartary were divided into two tribes, the *Ak Tak*, to which he belonged, who are of the *Naqsh-bandí* sect, and the *Kura Tak*, who are *Kadarís*, and who never cordially joined the other. ISHÁK KHOJEH was the chief of the latter. Sometime subsequent to his being appointed governor of *Kashgar*, he was called to *Pekin*, but never heard of after. It is supposed the Chinese were afraid of his influence, and that he was got rid of by poison.

Revenue—Albaum, or Land Tax—and Customs.—The revenue derived by the Chinese, or rather the payment made to them by their subjects in Chinese Tartary, is denominated “Albaum,” which consists of a capitation tax of one rupee from each man, per month, and a tenth of the produce of the land.

Syeds, múllahs, pírzádehs, faqírs, soldiers, &c. are excused from paying the “Albaum,” according to the laws of GENGHIS KHÁN. Formerly, land customs were levied on merchandize in transitu through the province; and were collected at the rate of $2\frac{1}{2}$ per cent. on the value, (or as the narrator described it, “1 in 40, that is, of 40 pieces of cloth, one was taken;”) but, about twelve years ago, this duty was entirely abolished, by order of the Emperor of China, and merchandize now passes free of impost.

Population and Language.—The native population of the country is Usbek, divided, as before stated, into two distinct classes, the Ak Tak, and Kura Tak. The language generally spoken is the Jaghatai Turkí, which the Kalmuks also understand. This is probably the purest dialect of the Turkí language, there being less admixture of Arabic and Persian, than in any of the others. A collection of a few common words will be found annexed to this memoir, which will show its great affinity to the other branches of that widely diffused tongue.

Chinese Troops.—The military force stationed by the Chinese in their provinces, is said to amount to between twenty and thirty thousand men.

Nature of the Government.—The Chinese government is represented to be very unpopular, at the present time, throughout these countries. There seems to be nothing in its system calculated to conciliate, or productive of advantages tending to reconcile the people to subjection to foreigners. The feeling of dislike, with which the Chinese are regarded, has been latterly much increased, in consequence of their carrying on vast works of fortification, and building walled towns, by the forced labour of the natives. The Musalman princes, chiefs, &c. are said to occupy, by the natives who had passed through India, nearly the same political position under the Chinese residents, or Umbauns, and stand in the same relation to them, as they supposed the Nawábs, Rájas, &c. of this country do to the residents of the English government, the Chinese interfering little in the direct management of the people, and leaving to the native princes the administration of the government and laws. The revenue, however, is realized entirely by the Chinese, the princes, &c. having large landed assignments.

English in India.—It is known at *Yárkand*, that India is governed by a nation of Europe (Feringís); and, it is said, that the Chinese entertain a high notion of the power of the English, which they view with feelings of apprehension, connected with an idea, that is prevalent in the country, of its being destined to fall into their hands.

Chinese Tartary accessible to European travellers.—It is said, that provided a person would dress as a native, allow his beard to grow, and accompany pilgrims on their return from Mecca, there would not be much difficulty in penetrating into Chinese Tartary; but that the easiest way would be by way of *Kokan* and *Kashgar*, as large káfilás of merchants pass that way. The person must, however, be able to speak Turkí, as very few of the natives of the country understand Persian; whereas, in the *Kokan* country, in Independent Tartary,

the population of whole towns speak nothing else. It would not be difficult for the individual to go even to *Pekin*, in China. All that is requisite is to get a pass from the governor, by paying a few tenkehs to the Chinese officers, giving out that his object is trade. My informants stated, that some years ago, a European made his appearance at *Yárkand*, in a native dress. He was discovered accidentally, and brought before the governor, who threatened him with torture if he did not confess who he was; but assured him that he would be well treated, if he spoke the truth. He admitted that he was a European, and was sent out of the country.

The foregoing particulars were elicited from various natives of the country, and at different periods, as they happened to arrive at Bombay, in their way on a pilgrimage to Mecca. One of these individuals was a prince of the country, another a *pírzádeh*, both persons of considerable education and information: the first was a native of *Auksú*; the second had travelled to *Badakshán*, *Kurratigin*, *Derváz*, and *Kokán*. Another was an inhabitant of *Eelchí*, in *Khoten*.

At the time this information was collected, I had not seen the works of Lieut. BURNES, or TIMKOWSKY, nor the papers by the Baron HUMBOLDT, and Monsieur KLAPROTH, in the *Journal Asiatique*.

It is remarkable, however, and perhaps, may add to the value of this information, that the accounts given me generally corroborate those of the above-named distinguished characters, with the exception of what Lieut. BURNES' informants told him respecting the troops in Chinese Tartary being *Túngánís*, which mine say is not the case; and the reason given by them seems to prove the truth of their assertion.

Collection of Words of the Turkí dialect, spoken at *Yárkand*.

Water	<i>Su</i>	Well	{ <i>Kuduk</i> and	Light	<i>Taghatteh</i>
Fire	<i>Ot</i>		<i>Kulduk</i>	Far	<i>Zirák</i>
Smoke	<i>Chakàn</i>	Salt	<i>Tus</i>	Near	<i>Yakin</i>
Steam	<i>Ohák</i>	Ghí	<i>Siriluja</i>	High	<i>Agis</i>
Man	<i>Ar Kisheh</i>	Milk	<i>Sut</i>	Mountain	<i>Tagh</i>
Woman	<i>Mazlam Kisheh</i>	Dog	<i>It</i>	Valley, or	{ <i>Dawàn</i>
Girl	<i>Kiz (billa)</i>	Cat	<i>Mushshak</i>	Pass,	
Boy	<i>Oghal (billa)</i>	Horse	<i>A't</i>	Head	<i>Bùsh</i>
Red	<i>Kizzil</i>	Sheep,	{ <i>Koyi</i>	Mouth	<i>Yaghis</i>
Black	<i>Kara</i>	<i>Dúmba,</i>		Nose	<i>Bazùn</i>
Green	<i>Yashil</i>	Cow	<i>Galleh</i>	Hair	<i>Tik</i>
Yellow	<i>Sarak</i>	Ox	<i>Oyi</i>	Foot	<i>Put</i>
White	<i>A'k</i>	Bull	<i>Bokakeh</i>	Ear	<i>Kullàk</i>
Good	<i>Abdàn</i>	Camel	<i>Togheh</i>	The goat	{ <i>Akhchèh</i>
Bad	<i>Yamèn</i>	Ass	<i>Ashakr</i>	producing	
Old	<i>Aski</i>	Mule	<i>Khacha</i>	the Kash-	
New	<i>Yengi</i>	Dark	<i>Kàràngo</i>	mír wool	

Arm	<i>Kul</i>	Ice	<i>Muz</i>	Five	<i>Bash.</i>
Sun	<i>Kiün</i>	Snow	<i>Kär</i>	Six	<i>Alleh.</i>
Moon	<i>Ai</i>	Rain	<i>Yamghür</i>	Seven	<i>Yetteh.</i>
Night	<i>Kicheh</i>	Deer	<i>Käk</i>	Eight	<i>Sakis.</i>
Star	<i>Yeldüz</i>	Road	<i>Yöl</i>	Nine	<i>Tokus.</i>
Year	<i>Yel</i>	A Sheep	<i>Kòl</i>	Ten	<i>On.</i>
Stone	<i>Tash</i>	The wool	} <i>Tibbit.</i>	Twenty	<i>Yegirmi.</i>
Silver	<i>Gunish</i>	used for		Thirty	<i>Otus.</i>
Gold	<i>Allür</i>	making		Forty	<i>Kerk.</i>
Iron	<i>Tumir</i>	Kashmír		Fifty	<i>Alek.</i>
Wool	<i>Yung</i>	Shawls		Sixty	<i>Altmish.</i>
Fool	<i>Tukheh</i>	One	<i>Bir.</i>	Seventy	<i>Yelmish.</i>
Sister	<i>Saulin</i>	Two	<i>Iki.</i>	Eighty	<i>Saksen.</i>
Brother	<i>Yanüm</i>	Three	<i>Uch.</i>	Ninety	<i>Toksan.</i>
Wind	<i>Shamäl</i>	Four	<i>Tut.</i>	Hundred	<i>Yuz.</i>
				Thousand	<i>Ming.</i>

VERBS.

To give	<i>Birmäk.</i>	To sell	<i>Satmäk.</i>
To take	<i>Almük.</i>	To eat	<i>Kich kanch almak.</i>
To speak	<i>Dimäk.</i>	To buy	<i>Satab almak.</i>
To strike	<i>Urmäk.</i>	To drink	<i>Ichmak.</i>
To carry	<i>Makmük.</i>		

II.—*Some Account of the Hill Tribes of the Piney Hills in the Madura District. Extracted from the MS. Journal of the late Major WARD. Madras European Regiment, communicated by Capt. T. J. TAYLOR,*

The primitive inhabitants residing in the Varshagherry and Kumnundaven mountains, are the Kunnuver Villalers, in number amounting to about 4000 of both sexes, who resorted to them, it is supposed, about four centuries ago. They may be classed with the Villalers of the plain, yet differ in their habits and manners, scarcely having any intercourse with each other, or forming any connection by marriage. This latter circumstance may, however, in some degree be attributed to the difference of climate, the extreme cold of which the inhabitants of the low lands are unable to endure. It is still more singular that even among themselves they have peculiar habits and customs, which distinguish those in the east from their western neighbours: the latter consider themselves as something superior, and have no communication with each other. In their marriages, the Kunnuvers of the east invariably use a teak-wood stool when performing the ceremony by way of distinction: those of the west are not so particular, the bride and bridegroom are seated on stools, the floor of the house being previously garnished with cow-dung, and fantastically ornamented with streaks of flour. When the operation of sprinkling saffron-water is over, the husband performs the most important part of tying the tally, a small golden ornament, around the neck of the bride; the whole concludes with an entertainment to the relatives and friends of

both parties. The *Puryum*, or marriage gift, to the relations of the bride, is a pair of oxen; to the west only one bullock, and sometimes a cloth, as a present to the mother of the bride. Incontinency is however very predominant, and separation between man and wife, not unfrequent, subject often to caprice. If a man feels an inclination to alienate himself from his wife, he has only to make his intention known to her parents, who receive her back with an offer of a pair of oxen. To the west she is turned over, simply with a *Vatti*, or metal dish, in use, to eat victuals out of. In case a woman is displeased with her husband, and absolutely wishes to part from him, she is at liberty, only she must leave all her golden trinkets, if she has any, to her husband; those of silver she takes, being considered as her own property. To the west, however, the wife is only permitted to take back such articles as she may have possessed before marriage, and if she has any children, they are left behind as the sole property of her husband. Should such separation take place, when the woman is in a state of pregnancy, (and in the interim, be married to another man,) the child then born must revert to the legitimate father. The care and expense of weaning it, to the east, is recompensed by a donation of 30 fanams; towards the west, it is delivered to the father, on his demand, and no recompense made: the children of such a connection are allowed to grow up, and then as if by instinct return to their real father, who is bound to receive and protect them. A woman may marry as often as she chooses, but can have only one lawful husband at a time, though she may bestow her favors on another, provided he be of the same caste: any sexual connection with a man of another tribe would tend ultimately to expel her from the caste. A man may marry, if his circumstances will admit, as many wives as he pleases; for concubinage is not permitted: and to a man of some opulence, two or three women are necessary in his domestic affairs; they are also very useful in the fields, as the toilsome labour of weeding and watering devolves chiefly on them. Among the western Kunnuvers, a circumstance rather singular is supposed to prevail, in case of an estate devolving on a female, which is likely to occur from the default of male issue; she is prohibited marriage, but undergoes the ceremony of being betrothed to some part of the dwelling; she is however allowed to have an intercourse with the opposite sex, and to the offspring of such a connection, if a male, the estate devolves. The women of the eastern parts are very uncouth, and wear brass and metal necklaces, with a profusion of bangles on their arms and legs, and bore the membrane between the nostrils; the latter is also peculiar to the women of the west, who are

rather superior, and more modest in the wear of ornaments: a few stone or glass beads around the neck, called Kulpashy, and rings, are their only decoration; they wear a white cloth, not very clean, from above the shoulders, knotted in front, and made fast round the waist with a bandage; those to the east wear theirs similar to the females of the low country. The men are very simple in their finery, having a couple of cloths, one worn round the head, and the other about the waist; they seldom or ever wear sandals, and by way of ornament, display a few golden trinkets, pendent from their ear. Their dialect is the Támul, which they speak fluently; but are otherwise illiterate. The Kunnuvers burn their dead, with the exception of barren women, and those who may die of the small-pox, who are buried.

The Kárákat Vellúlers.—This class of people are the primitive inhabitants of Anjinad, or five counties, or portions into which this division appears to have been divided on their first settlement in these regions: they are considered a people of superior caste, their custom and manners being indicative of it, though not in any manner esteemed above those of the same caste in the low country. A bráhman usually performs the duties at their temple, and the other ceremonies, &c. &c., as marriages, &c. are performed by a *Pandarun* or priest of their own caste. They speak the low Támul, but are most of them illiterate. A Támul school of late has been established at Muraúr. They are a very abstemious race. Rice constitutes their principal food, as also tyre, milk, and butter. They have no aversion to fowl or animal food, and use ghí as a substitute for oil; with it they also anoint themselves previous to bathing. They are not addicted to spirituous or fermented liquors. Opium is in use among them in moderation, and they chew and smoke tobacco. The apparel worn by both sexes does not differ in the least from the inhabitants of the plains, and consists chiefly of coarse white cloths; the women, besides the small ornaments worn in the nose and ears, decorate their arms with silver bangles, and such whose circumstances will not admit of their being of silver have them made of brass. A few of the men have the exterior membranes of the nose bored; and all invariably decorate their ears with rings: sandals for their feet are prohibited them. They are known to associate with the Kunnuvers, to the east: though their customs and manners greatly differ. Both castes make no scruple about eating what is cooked by either. But a Kunnuver, when invited to an entertainment by a Karakat, is not admitted to that part of the house, where the meats are dressed, nor is he allowed to touch any of the cooking implements. This class, by the laws of their sect, are contracted in marriage, when very young; it however happens, when the parties

are at an advanced age, (owing, it is said, to a deficiency in the number of females,) that some of the men are obliged to lead a life of celibacy. A plurality of wives is not uncommon. It is only admitted, however, in case the first proves barren ; but a connection of such a nature cannot take place without the consent of the first wife, which must be obtained eventually. A widow is by no means restricted, she being at liberty to marry another man, if she feels inclined to do so. It is not uncommon for them to prefer remaining in widowhood. Chastity among the fair sex does not appear to be a leading virtue among them ; they are supposed, unknown to their husbands, to bestow favors on their male relatives, as well as on their neighbours. But in the event it is ascertained, that a female has had sexual connection with an individual of a lower caste, she is immediately expelled, and banished beyond their limits, when she becomes the property of some Kunnuver, who is always happy to afford her an asylum : in case an individual of this class debases himself by cohabiting with a woman of another caste, he also undergoes the sentence of banishment from his native soil. In the primitive times this crime was punished with death. The marriage ceremony is performed at the house of the bride : a Pandál being raised before the door, under it the parties about to be consummated undergo oblation : they then retire into the house, and are seated on the floor, previously garnished, with their faces towards the east ; a lamp is kept burning on a stool, also a measure full of paddy, and a symbol of Vignashner, made of cow's dung, on the head of which are stuck two blades of the Acrumpulla grass, to which the bride and bridegroom prostrate themselves ; on rising, the relatives present the Tully, a small golden trinket, to the bridegroom, who ties it round the neck of the bride. A bason of milk being introduced, in which are steeped some areca leaves, ficus religiosa, with some of which the elder relations sprinkle the heads of the bride and bridegroom ; they then get up and prostrate themselves before their joint relations, and the marriage concludes with an entertainment. On distributing betel and areca to the company the bridegroom, accompanied by his bride, retires to his own house, where the day after he entertains his friends and relatives. The *Puryum* or marriage gift is 30 fanams, and a cloth given by the bridegroom to the bride's relations. The money is converted into jewels to adorn her person. Estates invariably devolve to the eldest son. In case there be two or more, the property is equally distributed among them. They purchase the polians as slaves ; price of a male 30 fanams ; that of a female, 50. She is considered of more value on account of the children she may bear, who when born are the property of the master.

III.—*Notice of Ancient Hindú Coins, continued from page 640.* By
JAMES PRINSEP, Secy. &c.

Plate L.—Hindú coins of middle age.

To whatever period it may be finally determined to adjudge the series of *Gupta* coins described in my last paper, there can be no hesitation in regard to the first group of the present plate; though here again, had it not been for inscriptions relating to the same period, the absence of credible history would have left us as much in the dark as ever.

These coins are found, like the former, in greatest abundance in the vicinity of *Kanouj*. Ten of them were picked out of a remittance from the Cawnpur collectory. The Asiatic Society possesses some found at Allahabad by Dr. A. TYTLER; I have several from *Azimgarh*, and other places, besides four of gold in KERÁMAT ALI's collection from the Panjáb; Col. SMITH, Dr. SWINEY, Lieut. CUNNINGHAM, also possess specimens, and I have examined those in Col. WILLOUGHBY's cabinet; but the most plentiful supply, of gold, silver, and copper exists in Col. STACY's cabinet, whence I have selected most of the specimens now engraved.

It is rather singular that no mention of a species of coin comparatively so common, is to be found in MARSDEN's *Numismata Orientalia*. The only published drawings of them are, I believe, those accompanying Mr. WILSON's notice, in the seventeenth vol. *Asiatic Researches*, which were taken from coins in his and my own cabinets. This gentleman was the first to attribute them to their rightful place in history, although he had but one well ascertained name (*Govindu Chandra*) to guide his judgment. Upon a careful examination of the several collections mentioned above, I have now succeeded in adding five new names to his list, so rapid is the progress and success of the efforts now directed to this line of research.

The figure on the obverse of all these coins is of precisely the same character;—a rudely executed front view of a male or female (it is difficult to say which), seated in the native fashion, with a glory round the head, and some unintelligible objects in her hands. Prof. WILSON names her *Laxmí*, on the ground that the princes of the Rahtore dynasty were of the *Vaishnaví* sect. In this case, we may recognize in her the female holding the cornucopia of the former Canouj group, sadly altered for the worse in point of execution.

The inscriptions on the reverse are, with one exception, easily legible; they are in a much more modern form of Devanágari than the last, differing little from the present style, except as to the vowel inflection *e*, which falls behind the consonant to which it is attached, as in

Hindu Coins-2nd Canouj Series.



the *Gaur* or *Bengálí* alphabet. The same remark applies to the letter *j* (fig. 8), which assimilates to the Bengálí and Tibetan forms, and serves admirably to shew the transition of this letter from its original shape in the most ancient alphabet where it closely resembles the Roman *E*, to its present modified form *ज*.

The figures in my plate are not placed with any regard to chronological order, but rather according to their comparative frequency of occurrence: figs. 1 and 2, being by far the most numerous of the set.

On figure 1, we make out the words श्री मद्भा देयदेव ॥ *Srī mad Jádjè-ya dèva*. This variety is comparatively common in gold. Lieut. CUNNINGHAM has one of silver.

On figure 2, the most common of the class, are the very distinct words श्री मद्भोविन्दचन्द्रदेव; below the letters वि and च are dots, which supply the place of the *n* or *anusvara*, so that the full reading should doubtless be श्री मद् भोविन्द चन्द्रदेव, *Srī mad Govinda Chandra dèva*; the gold of some specimens of this variety is of inferior quality.

Figure 3 is the one I have noted as being difficult so decypher. I have as yet only found one of the sort; it is of Col. STACY'S cabinet. The letters visible are श्री मद्भा महवेचे णम, *Srī mad Rāma havè che nam*. The व may possibly be an र, making the reading *Rāma Hari*; but we must wait the discovery of duplicates before we can complete or rectify this uncertain name.

Fig. 4, (KERÁMAT ALÍ) is more easily legible, श्री मत्कुमरपाल देव *Srī mat Kumara Pála dèva*.

Fig. 6, from the same collection, is a small coin of the same prince.

Fig. 5, is equally distinct, श्री मन्महीपाल देव *Srī man Mahí Pála dèva*. It is from a single coin in Col. STACY'S collection.

Figs. 7 and 8, (STACY,) one of copper, the other of silver, help to decypher one another. The complete legend is श्री अजय देव *Srī Ajaya dèva*.

Lieut. CUNNINGHAM has sent me an impression of a copper coin of the same class, on which the name appears to be श्री मद्लक्ष्मी देव probably *Srī mad Laxmi (Pála or Chandra ?) dèva*.

It was, as I have said above, the occurrence of the name of GOVINDA CHANDRA DE'VA, which led Mr. WILSON to ascribe this group to the *Ráhtore* princes of *Canouj*, who held the sceptre of that ancient city for a century prior to the overthrow of their last and best known Rájá, JYCHAND (*Jaya Chandra*), by SHAHÁB-UD-DIN. One of our coins undoubtedly belongs to the former prince, and it may perhaps be allowable to give the last two, figs. 7 and 8, to JYCHAND himself, whose proper name may have been *Ajaya Chandra dèva*; the family

name *Chandra* being frequently omitted both in writings and in inscriptions. But the remaining coins of our series, two of them having the family name *Pála*, cannot be reconciled with any of the princes in the short *Ráhtore* line, of which every individual from the first conqueror CHANDRA DE'VA, in A. D. 1072, is known to us through the concurrent testimony of several inscriptions. What was the antecedent dynasty? has been a question hitherto imperfectly answered; the traditions cited by Colonel TOD being, as stated in my last paper, at total variance with inscriptions. The latter indeed only record two names, YASOVIGRAHA (or *Srípála*?) and MAHICHANDRA prior to the conquest of CHANDRA DE'VA. The latter of these should probably have been MAHIPÁLA, of whose reign in the early part of the eleventh century, the inscriptions at *Sárnáth*, *Dinájpur*, and *A'mgáchi* supply ample evidence, now indeed confirmed by the superscription of his coin in fig. 5. YASOVIGRAHA, in like manner, may be referred to the VIGRAHA-PÁLA DE'VA of the *Dinájpur* inscription, and thus the sur-name of *Pála* may be restored to both these princes.

Although *Gaur* in Bengal was the original seat of the *Pála* family, there is no reason to doubt that they had acquired the paramount sovereignty of India, and that the seat of their government was fixed for a time at least in Canouj. Indeed, branches of the same family may be traced to the westward—to the *Pálas* of *Málwa*, one of whom (ANANGAPÁLA) rebuilt Delhi, or re-established it as his capital; and perhaps even to Guzerát, where we find the occurrence of a KUMÁRA PÁLA, in 1100, who may probably be the owner of our coin, fig. 4, especially as his son is named AJAYA PÁLA, who may be the AJAYA DE'VA of figs. 7, 8. In evidence of the identity of this family, it may be sufficient to note a few facts, referring to the elaborate observations of WILFORD, and the subsequent notices of COLEBROOKE, and those of FELL, and WILSON, in the 15th volume of the Asiatic Researches.

The list of the kings of *Gualior*, noticed by WILFORD, consists of 85 names, all having the affix of *Pála*, “in accordance with the prediction of Guapála the hermit, their progenitor*.” Now the founder of the *Gaur* family of Bengal is equally a *Gopála*, though some authorities call him *Bhupála*, a name of much the same import, and denoting his rustic extraction.

Again, the grandson of ANANGAPÁLA, the *Tuár* conqueror of Delhi, is stated to have returned to *Gaur*, “his native country,” after the defeat and death of PRITHIVI PÁLA, or PITHAURA. Thus ANANGAPÁLA too was of the Bengal family: moreover he was either the grandson or the fifth in descent from *Chandra Pála*†, or *Chaitra Pála*‡, of *Málwá*,

* As. Res. ix. 154. † Ayín Akberí. ‡ WILFORD.

“who swayed all India,” after JAYANANDA: and the Musalmán writers affirm that “after *Gebál* (or *Chait Pála*), the *Balhára* kings of *Guzerát* became paramount emperors of India*.” It is not, however, absolutely necessary to travel so far to the west for a *Kumára Pála*, since in ABUL FAZL’s list we find a prince of this name immediately following ANANGAPÁLA in *Málwá*; and FERISHTA also makes a KUNWER RAY (*rāja Kumára pála*) reigning at *Canouj* on the invasion of MAHMUD. There is evidently some connection between all these different dynasties, and although the subject is now involved in almost inextricable confusion, from the discrepancy of the several lists in the *Ayín Akberí*, in RAGHUNÁTH’S *Rájvalí*, and in the *Agní Purána*, we may hope, through the fortunate discovery of the present coins, and others that we may now confidently hope will succeed them, to arrange the names in a satisfactory and coherent manner. It is evident that the *Canouj* mint produced this series continuously, as the alphabetic type is preserved through the whole unaltered. It will be seen presently that the same distinctive characters appear at a particular point, both in the coinage of *Guzerát*, and in that of *Chitor* or *Mewár*; and in both cases sufficient of the name remains visible to shew that it terminates in *Pála deva*, and therefore, that it marks the spread and paramount sovereignty of the *Gaur* family across the whole continent of India.

Figs. 13, 14, 15, 16, are silver coins found in abundance in many parts of India, but chiefly towards the desert to the west of Delhi. Colonel STACY’S cabinet is rich in them. Mr. WILSON’S plates exhibit others from Colonel MACKENZIE’S and my own collection. They weigh on an average 50 grains, or three *massas*.

On the obverse is a figure of the boar, or the *Varáha avatár* of VIṢṆU, and the *chakra* or discus of this god is visible on many of the specimens. The character on the reverse is again of quite a new form. Instead of the square-built *Gaur* alphabet, or the *Gujerátí* letters, we have here the nail-headed letter common to the inscriptions of the *Tukshac*, *Jit*, and *Mori* princes, of *Haravatí* and *Mólwá*, described in TOD’S *Rájasthán*, App. vol. I. which belong chiefly to the 7th, 8th and 9th centuries. This vague coincidence may help in assigning the place and period of their coinage, which otherwise there are no data to trace. The full legend of the coins, made out from collation of the engraved figures and from many others in Colonel STACY’S cabinet, is श्री मदादिवराहः *Srī mad ādi Vārāha*, which is nothing more than the title of the incarnation, and affords no clue to its appropriation. Below the

* WILFORD, As. Res. ix. 164

legend is in general visible a square or oblong central ornament, with two balusters on the sides: their intent is beyond my apprehension.

Fig. 17, differs from the preceding in the reverse, although its general similarity and its being found in company shew it to belong to the same family. The two baluster-looking ornaments again meet the eye—on the reverse is the initial word श्री *Srī*, and below it ये or पै, *yo* or *po*.

The flourish on the left hand is evidently intended for a human face viewed in profile.

In 18, the word *Srī* is again very distinct, but the head of the boar-god is also apparent. In the Society's plate, I was the cause of Mr. WILSON's mistaking the word श्री for the letter ढ reversed, from my having engraved the figure upside down.

In 19, and 20, the human profile is better defined than in 17. The contour of the ear, cheek and shoulder may be distinguished; the eye, nose, and lips, are represented by dots. In 20, the word *Srī* is still discernible.

On the reverse is a single letter, either *k*, *s*, or *m*, amidst flourishes.

In 21, the boar again appears, with the letters वह *vaha* or perhaps एक *ek*. Of this sort, a quantity were dug up while I was at Benáres, by Mr. TAYLOR, judge of Mirzapur, near Sultanpur. Mr. GUBBINS found several at Gurgáon to the south-west of Delhi.

It seems impossible that coins so plentifully found in Upper India should have been struck in the peninsula, or we might from the device and superscription attribute them to the Vijyanagar sovereignty; for Colonel WILKS informs us, that "Varáha, the boar, one of the incarnations of VISHNU, was the emblem which these rájas adopted, as the impression on their gold coins, and the coin was and is named *Varáha* in consequence, in the Hindu languages of the south." The restriction however of this name to the small gold coins or *huns* of the south is against this hypothesis. One of the Vijyanagar *Varáhas* (of DEVA RAYA?) is depicted as fig. 80 of Mr. WILSON's plates; and though the attitude of the *avatár* is a rude imitation of ours, the form of the Nágarí character is there essentially different, and much more modern.

Similarity of name might tempt us to assign them to the *Varáhas*, a powerful Indo-Scythic tribe to the west of Jesalmèr, who were frequently in collision with the Bhattis in the eighth century, or the foundation of Tunnote*. But it does not appear from Col. POTTINGER's description of them, under the name of *Brahooes*, that these were ever

* Tod's Rájasthán, ii. 229.

of the Hindu faith, whereas the emblem and inscription could have proceeded only from an authority strictly *Vaishnaví*.

Fig. 22, from the STACY collection, would appear to be an interloper in the Upper Provinces; since the majority of this type have hitherto been found in Ceylon, some in the palace at *Candy*, others by Colonel MCKENZIE at *Dipaldinna*. They all however belong to the genuine Hindu rajas of that island, judging from the alphabet and the name.

The rude outline on the obverse, is intended, probably, for a rāja holding some mace or warlike weapon in his right hand. On the reverse he is seated in a lounging position, with a view to make room for the inscription on the side. This in the specimen before us is श्री मया त्रय मल्ल *Srī mayá traya mallu*. The second word is read by MARSDEN, in a specimen very like it, दय *daya*. And on another coin he finds the name of VIJAYA विजय (मल्ल?) well known in the history of Ceylon. Mr. WILSON does not attempt to read the names on his coins, which are badly drawn; but on comparing them, they appear not essentially to differ from Colonel STACY's. No family of the name of *Malla* occurs in the Indian genealogies except in Nípál, where, from the 13th century to the Gorkhá conquest, the reigning prince almost always bore the affix of *Malla*. In the honorable Mr. TURNOUR's catalogue of the Ceylon monarchs, I do not find any such name.

Figs. 24 and 25, are two more modern copper pieces, selected from many of a similar nature in Colonel STACY's cabinet, as forming a good land-mark in judging of the antiquity of other Hindu coins. The rude attempts at a human figure in 24, are far inferior to any thing we have yet seen, unless in its companion 25, where we can hardly pronounce them to be other than signs and symbols. The name and date on most of these coins are distinct enough, and in the present type of *Nágarí*, श्री संग्राम सिंह १५८०, *Srī Sangráma Sínga*, 1580 (*samvat*). Sometimes the name is written संग्रम, and at others संगम, *Sangrama* and *Sangama*, variations to be expected in such imperfect samples of the engraver's art.

Fig. 27, is of the latter description, having the name *Sangama* preceded by the letters भक्तग. The reverse of this coin has the figure of a heart, which is very common on copper money dug up in the Ságur district, of the Muhammedan princes of the Berar provinces. Arabic letters are clearly distinguishable above the heart.

From the date of these coins, we recognize them as belonging to the celebrated SANGRÁMA SINGH, or SINKA of the Moghul historians, who for a short period successfully resisted the victorious BABER at Biána.

A romantic account of the chivalrous adventures of his youth is given by Colonel Tod*. He succeeded to the throne of *Mewár*, in S. 1565, (A. D. 1508,) and is accounted by the Rájput bards the "*kalsu*," or pinnacle of its glory. His encounter with *BABER* at *Kanúa* occurred on the 5th Kartik, S. 1584, (=15th October, 1527,) four years subsequent to the striking of these coins, which, by the way, are no very convincing evidence of the flourishing state of the arts in *Chitôr* at the summit of its splendour and glory.

Fig. 26, is a small square copper coin in Colonel STACY's cabinet, also of modern fabrication; on one side inclosed in a marginal frame, which proves that the whole inscription is before us, are the Nágari letters एक लिस् *èk lis*. It may be that *lis* is the name of a coin of which the specimen represents the unit; or possibly it should be read एकालिस् *ekális*, the fortieth or rather forty-first of the current silver coin of the place? The division of the field on the reverse into upper and lower compartments, so far resembles a gold coin from *Canouj*, described by Mr. WILSON, as fig. 52, Plate III. The letters are कभ कंस्त्री an unintelligible compound.

Fig. 28, is another rude Hindu paisa of a late period. A human figure on the obverse, holds a staff in his right hand; on the reverse are the letters व स ण स र जो *basan sar ji*, an unknown and doubtful name.

Plates XXXVI., XXXVII. Rájput Coins.

In the two following plates, I am again indebted to Colonel STACY's numismatic zeal for the greater part of a very curious series of Hindu coins, on the one hand linked by the subject of their impression with the Indo-Scythic series, and on the other gradually mixed with and transfused into the Arabic currency of the first Mohammedan conquerors of Central India.

Now that I am myself in possession of nearly 100 of these coins in silver, it appears strange that they should hitherto have escaped so completely the notice of our Indian numismatologists; neither MARSDEN, WILSON, nor Tod, having published a single engraving of them. When therefore I first received a sealing-wax impression of one from Dr. SWINEY, in August, 1833†, it is not surprising that I should have announced it as an *unique*. Colonel STACY's letters soon taught me to consider it in a very contrary light, and now on reference to Colonel Tod's personal narrative, I find that they had

* Rájasthán, i. 295.

† See Journal, Vol. II. page 416, and fig. 11, Plate XIV. of the same volume: I then supposed the coin to be of gold; it was of silver.

not escaped him in his travels, although he has not favored the public with any drawings of them, or any comments on their age and locality.

Munshi MOHAN LÁL's collection of coins made at *Cábul*, afforded me a favorable opportunity of ascertaining the accurate names and readings of the silver group, but unfortunately these do not embrace so much variety as the copper coins. The reason for this may be, that the munshi's collection was discovered in a foreign country. A treasure accidentally dug up, however numerous, would naturally consist of the money then current, with a small admixture of that of preceding reigns: in fact, out of 100 coins, 65 belong to one type (figs. 3, 4, 5.), 25 to another (figs. 1, 2.), and only three or four to a third (figs. 6, 7.). Colonel STACY on the other hand had the advantage of exploring the very field in which they must have been at one period current, and his series is, therefore, much more complete, though rarely so numerous in any particular species. A letter from this gentleman to my address, dated 2nd August, 1834, suggests, that "as the figures both on the obverse and reverse of these coins are evidently made up of letters, either of Sanscrit or some other Hindu characters, they should be submitted to the kind attention of the professors of the Hindu college. The great variety, and the general distinctness of the characters on them, holds out fair hopes of our becoming acquainted with the dynasty they belong to, as well as with many of the individuals of that dynasty. The names placed against each by pandits, to whom they have been shewn, are worthy of no reliance. The natives possess neither enterprize nor invention; when they find a letter or letters wanting, they will not attempt to fill up the blank."

The opinion here broached, that the outline figures were made up of letters, is supported by the authority of Colonel TOD, who remarks in the only passage I can find on the subject, (vol. i. p. 698.) "My envoys brought, from *Nadolaye*, a small bag full of curious hieroglyphical (if I may so use the term) medals of the *Chohan* princes. One side represents a warrior on horseback, compounded out of a character to which I have given the above term; on some there was a bull; while others, retaining the original reverse, have on the obverse the titles of the first Islamite conquerors, in the same manner as the currency of France bears the effigies of LOUIS XVI. and the emblems of the republic. Whoever will pay a visit to *Nadolaye*, will find his labour amply rewarded; I had only leisure to glean a few of these relics, which yet formed a rich harvest."

When the singular contour of the horseman and bull is traced back to its original type in figures 1, 2, where the whole substance of the

figure is filled up, there does not seem to be much reason for imagining any intention of mystifying the device, otherwise than by the clouds of ignorance; when the engraver retained only sufficient knowledge of his craft to cut the outline of his device in relief, and latterly even seems himself to have lost sight of its meaning altogether, as in figs. 48, *cum multis aliis*;—certain it is, that the title of hieroglyphic has been earned and won for this coin even from the antiquarians of the west; witness the following highly curious passage, brought to my notice by Dr. SWINNEY, in an American work on scripture geography*, applied to a wood cut of a coin in all respects the counterpart of our figure 3, which may have found its way to Egypt, in the course of commercial dealings, eight or ten centuries ago:—

“This is an extremely curious medal, of silver, struck in Egypt before the reigns of the PROLEMIES. It represents on one side, a man on horse-back, and on the other, an ox of the humped kind lying down: between his horns is the lunar crescent, and within that is a globe. These symbols clearly refer this ox to Egypt. The man on horse-back is the most singular part of this medal; none of the countries adjacent having adopted the type of a horseman. There is every reason to believe that the letters on this medal are Persian, and that the person represented is ARYANDES, governor of Egypt under DARIUS, the last king of Persia, who then possessed this country, and who caused the governor to be put to death for coining money in his own name”!!

It can hardly be believed, that the nature of the characters should have been unknown to any but Transatlantic antiquaries, for they are in a very obvious form of Deva nágari, and may be easily read where the letters are not cut off or otherwise obliterated.

At the commencement of the foregoing essay, I alluded to this series as one of the four palpable imitations of a Grecian or Indo-Scythic model:—I had in my eye the coins of Azos and AZINISOS in particular, which have a horseman with spear for the obverse, and a humped bull for the reverse. On being Indianized, the bull has become the *nandí* of Hindu mythology, with its ornamental *jhúl* or saddle cloth, and the trident or *tirsul* of Siva impressed on its haunch. The horse has in like manner, received the trappings peculiar to the country, the *zèr-band* and *dúmchí*. The rider has still some traces of a flowing fillet from his cap (see fig. 5,) but his dress is not otherwise open to criticism. I would not pretend to insist upon the direct filiation of the Hindu coin to what I have assumed as its prototype: but the adoption of the same elements for the device, it may be surely contended, argues some connection or descent:—it is like the preservation of armorial insignia in a family; and on these grounds, we have pre-

* SMILEY'S Scripture Geography, Philadelphia, 1835, page 151.

† See Plates XXII. XXIII. of the June No., figs. 9, and 28.

Ancient Hindu Coins.
Silver



Copper



Hindu-Muhammedan Coins. *Copper*



the first of the year, the government had been in session for some time, and the country was in a state of great excitement. The people were anxious to know the result of the election, and the government was anxious to know the result of the election. The people were anxious to know the result of the election, and the government was anxious to know the result of the election. The people were anxious to know the result of the election, and the government was anxious to know the result of the election.

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sumptive evidence either of the Indo-Scythic descent of the reigning dynasty,—an hypothesis borne out by the traditions of many of the Rájput states,—or of a mere imitation of the coin of a neighbouring nation; in consequence of a poverty of native invention.

Before we proceed to canvas the epoch and country of this our third division of Hindu coins, which are matters entirely open at present, except so far that they have been called *Chohán* by Colonel TOD, and *Rájput* by STACY, it will be convenient to take a view of all the specimens that have been collected.

The whole series may be conveniently classed under three heads; namely, 1st, such as have genuine Hindu names and the oldest form of character; for the alphabet evidently undergoes modification as we advance:—2ndly, those with Nágari characters only, but expressive of Muhammedan names, either alone or conjointly with those of Hindu princes; and 3rdly, those retaining the equestrian device of the obverse, with also the name of the rája, but having the reverse occupied by a pure Arabic inscription.

I may premise that the average weight of the whole series of silver coins a little exceeds 50 grains, and that therefore they may be regarded as *tankas* of 3 *massas*, as was remarked of the oldest group and of the *Varāhas*.

Figs. 1, 2. These have been placed at the top of the list, because the relief in them is not confined to the mere outline. The device has already been described. There are letters on both sides of all the series, leaving us somewhat at a loss to know which side contains the rája's name, or whether the longer legend over the bull may not be merely his titles; the frequent occurrence of the *second* formula, on coins of various forms, is in favor of this view, but the actual name in the third is against it. On the present coin, the most obvious reading of the longer epigraphe is श्री स्यालपति देव *Sri Syálapati dēva*. Unfortunately the letters on the other side are cut off.

Figs. 3, 4, 5. The selection here was from 65 specimens, the collation of which left no doubt as to the context, unless in regard to the value of the fourth letter. Of the two readings suggested in my first notice of this coin श्री सामग्र देव *Sri Sámagra dēva*, or श्री सामन्त देव *Sri Sámanta dēva*, the latter is the most plausible, because SÁ-MANTA is a common Hindu name, a leader, captain, or champion; and although the *nta* is more like गू *gú*, in the best specimens, there are other cases, such as figs. 19 and 21, where it more nearly resembles the Bengáli न्त.

On the reverse, are the letters श्री and उ, on either side of the head. These are ancient forms of भौ and न *bhí* and *ta*. On fig. 4,

the latter is replaced by a non-descript flourish, so that the two are probably independent of one another in the reading.

Figs. 6 and 7, the last of the silver specimens, exhibit the cognate name of श्री भीम देव, *Śrī Bhīma dēva*; and on the obverse, the भी of the foregoing example.

Of the copper series, we may specify figs. 14, 15, 19½, 21, 27, and 30, as having the *Sāmanta dēva* legend over the bull, with other additions, or variations of style, on account of which they have been introduced into the plates.

But first in order should be noticed the six small copper coins, figs. 8, 9, 10, 11, 12, 13 of Colonel STACY's cabinet, which are connected with the present group by the effigy of the horseman; while on the opposite we recognize the latter Canouj form of letter, and the usual termination of the coins, described in the preceding plate. A scrutiny of the whole series (some not included in the plate) has elicited the letters श्री सा म म देव; the blank may be filled up with the letters *nta, pá*, making the whole title *Śrī Sāmanta Pála dēva*; or if it be thought that there is not room for other letters, it may stand as *Śrī Sāmala dēva*.

Fig. 17. Of this curious variety we have two or three samples: the bull is omitted, and the field occupied entirely by the legend. In the engraved figure, the commencement of the second line is cut off. Colonel STACY's has a letter there, and his pandits read the whole, *Śrī mam Kripa bamm bas*; but from the resemblance of the two final strokes to numerals, the appendage to the second *m*, and the analogy of the ordinary legend, I should prefer the reading श्री मन्म . थवर्म्म देव सं १. . *Śrī man m. . thavarmma dēva, Samvat 1. .*, the name and the date unfortunately remaining doubtful.

Figs. 21 and 30, are duplicates: one completing the missing portion of the other impression; but owing to the strange form of two or three letters, some doubt remains as to the correct reading. On the obverse, we find आशुक् राज देव *A'prichha Rāja dēva*, and on the reverse श्री समन्त देव *Śrī Samanta dēva*, with the addition of असावरी *Asāvārī*; the last syllables, वरी, might almost be read मी *mi* or वग *vaga*.

Fig. 27, with the *Śrī Sāmanta dēva* very much perverted on the bull side, has a new name on the right of the horseman, श्री दनपाल देव *Śrī Dana (or data) Pála dēva*.

Fig. 28, has an unintelligible name on the bull side: the letters visible are . . श्री वदासुर , . . *Śrī Vadā sura. .*

In fig. 29, the outline of the sacred bull is somewhat difficult to be traced. The name below it begins with the letters श्री कु पा. . *Śrī kupá*, or सा कुषा *Sá kusha. .*

Fig. 31, bears on the obverse the name of श्री हर देव *Srī Hara dēva*. The reverse seems to begin with the same letters as fig. 30, viz. अ सा *Asá*; after which follow at a short interval, .. मसाण देव .. *Masāna dēva*.

It may be hereafter found that some of the above belong to what may be called the transition period, when attempts were made to express Musalmáni names and titles in the vernacular character of India, of which I will now endeavour to produce such instances as Colonel STACY'S rich collection offers.

The name of the Rájá on the obverse of all the transition or *link* coins is श्री हसीर: *Srī Hamiras*; this important and well-known name may be found, either in full or in part, on figs. 20, (in this the engraver has reversed the whole die,) 22, 36, 37, 38, 39, and 40. The same name also occurs on figs. 44, 47, and 49, with an Arabic accompaniment, as will be presently noticed.

The first example of a Moslem title in its simplest form occurs in figs. 32 and 35, in the Nágari word सुरिताण *Suritán*; this has no meaning in Hindi, and I conjecture that it is intended for the Arabic title, *Sultán*: the remainder of the sentence is in these two instances wanting.

Figs. 34, 39, 40, and 41. In these four we find a more complete paraphrase of the far sounding titles of the Delhi sovereigns; at least I conjecture that सुरिताणसा समसदोण (or as in 34, देण) is nothing more than *Sultán Sháh Shamsh ud-dín*.

Figs. 36, 37, and 38, are equally capable, and only capable, of an interpretation on the same principle: the Devanágari letters on the reverse run thus: सामहसद सामे *Sá Mahamada Sámè*, which I would convert into *Sháh Muhammed Símè*. The initial word will admit of being read *Srī*; but the rest of the legend is quite clear and satisfactory.

The name of *Hamira*, as before stated, is repeated on the obverse of all these curious coins. We have now to trace it into a field one step farther removed from the primitive standard.

Figs. 48 and 49. In these, the first of the succeeding group in point of date, the horse and his rider, are transformed into singular symbols, which only our prior acquaintance with the original could enable us to decypher: the word श्री on the first, and the termination of *Hamirah* सीर on the other, are still discernible in their usual position. On the reverse, the characteristic style of the Afghán coinage is adopted, and the Arabic version, were it completely visible, would evidently be السلطان شمس الدنيا والدین التمش *Ul Sultán Shems ul-dunya va ul-dín Altamsh*. The reading commences from below.

Figs. 42 and 44, again exhibit to the right of the horse's head, the name of श्री हसीर: *Srī Hamiras*, as usual. On fig. 43, it escapes detec-

tion only by want of room on the field. In all three, the hieroglyphic which has hitherto passed for the helmeted head of the horseman, has been either designedly or unintentionally removed, and the Arabic word محمود *Mahmūd* substituted. On the other face, the full titles of this sovereign, who was the son of *Altamsh*, may be recognized without much trouble, thus: السلطان الا *Ul Sultán ul A-*

عظم ناصر الد *āzem Násir ul du-*

نيا والدين *nya va ul dín.*

the inscription terminating in the "*Mahmūd*" of the opposite face.

Fig. 25, of the preceding plate, is another coin of the same name and nature.

Fig. 47. On this variety of the *Hamíra* group, the Arabic titles are apparently السلطان فتاح الدنيا والدين *Ul Sultán Fatáh ul-dunya va ul-dín.* I only perceive one specimen of this reading in Col. STACY's collection.

Fig. 45. The next variety of the mixed impression retains the horseman with the Hindu name, but the Arabic titles are now السلطان ابو الفتح المعظم *Ul Sultán Abu ul fateh ul Moazzem.*

Fig. 24, is the last on the list, exhibiting the semblance of a horseman. The small portion of the Arabic legend, included on the reverse, is fortunately sufficient to point out the owner, and enable us to complete it السلطان الاعظم علا الدنيا والدين *Ul Sultán ul āžem Ala ul dunya va ul dín, (Muhammed Sháh.)*

Figs. 23 and 46. There still remains undescribed a curious variety of the "bull and horseman" coin, in which the bull side is retained with the *Srī Samanta dēva*; while, contrary to usage, the horse is omitted, or replaced by an Arabic legend in the connected or flowing character. The whole purport of it is not well ascertained, but the legible portion of the two middle lines is thus read by some السلطان Ul Sultán ul āžem, ul Sultán Adil. Others find in it the name of *Subactegín*; and I am inclined to adjudge it rather to an earlier period than the *Ghórí* dynasty, both from the Arabic style, and from the retention of the name of *Sámanta dēva* on the reverse.

Figs. 26 and 50. We now pass to a new form of coin, allied to the foregoing, indeed, by the retention of Hindí on one side, but differing from them in the total rejection of the pictorial emblems. That the proper orthography of the word *Sultán* was now attained is evident in the initial letters श्री सुलतान. *Srī Sultá.* The lower line presents three letters मव्वज *mavvaj*, which may be intended for *moazz*, thus agreeing with the Arabic of the opposite face الاعظم معز الدنيا والدين السلطان *Ul Sultán ul āžem moaz ul dunya va ul dín (either Bairam*

Sháh, 1239, or *Kai Kobad*, 1286 ?) the only two emperors which bore the appellation of *Moaz ul-dín*.

From the last coin, the passage is easy to those of purely Muhammedan aspect, such as are described in MARS DEN's *Numismata*, vol. ii.; but this author does not appear to have had an opportunity of examining an intermediate group of coins, on which, in deference to the conquered people, a Nágari inscription was retained on the margin.

They are by no means uncommon; yet it is rare to find the marginal legend perfect. MARS DEN's DCCXIII., of *Toghlak Sháh*, is of this species; but in it the Nágari falls beyond the limits of the disc.

I have therefore thought that a few examples of this group might form a proper appendage to the present series, and have accordingly introduced three varieties from Colonel STACY's and my own collections, to fill up the plate.

Fig. 51, the earliest in date, must be read from the reverse الاعظم غياث الدنيا والدين بلبس *Ul Sultán ul džem Ghiás ul dunya va ul-dín*, (and in the centre of the obverse,) *Balban*; the latter is encircled by a Nágari sentence, of which श्री सुलतान.. is visible.

Figs. 54, 55, and 56, are coins of the celebrated ALAUDDIN*, the disposition of the titles and name as before الدنيا والدين محمد شاه *Ul Sultán Alu ul dunya va ul-dín Muhammed Sháh*. On the margin, श्री सुलतानशा ७०६ *Srí Sultán Sháh*, (A. H.) 706.

Figs. 52 and 53, close our present series; they bear the titular designations of TOGHLAK SHÁH, الاعظم غياث الدنيا والدين تغلق شاه *Ul Sultán ul džem Ghiás ul dunya va ul-dín, Toghlak Sháh*. The Nágari of the margin is similar to the last, but imperfect, as if cut by one ignorant of the language.

After the complete and satisfactory evidence we have just examined, little need be said as to the epoch to which at least the mixed or Hindu-Muhammedan portion of the bull and horseman group belongs: for, from the names inscribed in Nágari or Arabic, or from the titles or cognomina, which are in fact as frequently the names by which the Musalmán sovereigns are known, we can nearly fill up the first century of the Patán monarchs of Delhi, thus:

Srí Muhammed Sáme is, I presume, MUHAMMED BIN SÁMUL GHORI, the first of the dynasty, commonly known by his cognomen *Shaháb-ul-dín*, who possessed himself of the throne of Delhi, A. H. 588, A. D. 1192.

Shamsh ul-dín, in Nágari and Arabic, is *Altamsh*, A. H. 607 A. D. 1210 *Moaz ul-dín*, must be BAIRAM SHÁH, his son, 637 1239

* At the time of engraving the plate, I mistook the MUHAMMED SHA'H for the son of TOGHLAK: the date corrects me.

<i>Alá ul-din</i> , may be MASAUD, the son of FIROZ, A. H. 640 A. D. 1242	
<i>Násir ul-dín</i> , denotes MAHMUD, son of ALTAMSH,	643 1245
<i>Ghias ul-dín</i> , BALBAN, has the full name also,	664 1265
<i>Alá ul-dín</i> , MUHAMMED SHÁH, bears its own date,	695 1295
<i>Ghiás ul-dín</i> , TOGHLAK SHÁH, cannot be mistaken,	721 1321

It is not from these names, however, but rather from the Hindu ones, that we must seek to fix the *locality* of the *bull* and *horseman* insignia, and the readiest mode of arriving at the truth is to proceed backwards, the best chance of verifying the names of Rájās being through their preservation, even in a corrupt form, in the pages of Moslem history. HAMIRAS, the name common to so many of the series, is admirably adapted for our purpose. He can be no other than the HAMIR* of the *Mewár* chronicles, who, born and nurtured in the forests of *Ondwa*, was destined to revive the glory of *Chitór*, even after it had succumbed to two successive assaults under the unsparing ALLA. We find it recorded in FERISHTÁ's history, (A. D. 1304,) that "at length finding it of no use to retain *Chitór*, the king ordered the Prince KHIZR KHÁN to evacuate it, and to make it over to the nephew of the Rája. This Hindu Prince, in a short time, restored the principality to its former condition, and retained the tract of *Chitór* as tributary to ALLA-UD-DIN, during the rest of his reign†." According to TOD‡, "HAMIR succeeded to the throne in Samvat 1357, (A. D. 1300,) and had sixty-four years to redeem his country from the ruins of the past century, which period had elapsed since India ceased to own the paramount sway of her native princes." These 64 years would include nearly the whole reign of ALLA I., and that of his successors OMAR, MUBÁRIK, KHOSRU, TOGHLAK, his son MUHAMMED, and FIROZ. On the coins themselves, we have found the obverse of HAMIRA coupled with the stamp of *Mahamad Sámè*, *Shams ul-dín*, *Alla ul-dín*, *Násir ul-dín*, and *Fatáh ul-dín*; three of whom are clearly anterior to the reign of ALA-UD-DIN; as ALTAMSH alone bore the cognomen of *Shamsh ul-dín*; his son that of *Násir ul-dín*; and MAHAMMED GHORÍ that of *Sámè*. We might indeed read the latter word *Sánt*, and so apply it and the title of *Násir ul-dín* to MUHAMMED II. the son of TOGHLAK, whose cognomen is not recorded. But still *Shamsh ul-dín* remains unexplained, and the apparent anachronism cannot be accounted for. It should be noted that the name of HAMIR is not mentioned in FERISHTA; but only the "nephew of the Rája Ratan Sinh." The cognomen *Fatáh ul-dín* is not to be found in the whole line of the *Patán* Sultáns.

* *Humberdew* of BRIGG's *Ferishta*, *Amir deo* of Dow, when speaking of the siege of Rintimpore: he is not mentioned afterwards by name, nor as of *Mewár*.

† BRIGG's *Ferishta*, i. 363.

‡ *Rájasthan*, i. 269.

Mewár had been in subjection to the Delhi monarchs since the invasions of MUHAMMED GHORI; ALTAMSH also invaded it in 1210: hence there can be the less doubt that the barbarized names, *Srī Mahamad Sáme* and *Srī Samasoden*, on the indigenous coinage applied to these two sovereigns, notwithstanding the difficulty above alluded to.

The fortunate preservation of HAMIRA's name, in conjunction with those of his allies, upon these coins, proves at any rate the identical place of their coinage, and fixes it at *Chitór*, the seat of the dynasty founded by BAPPA, in A. D. 727, after the destruction of the *Balhára* monarchy of *Sauráshtra*. This information also limits our search for the names previous to *Hamíra*, to the descendants of BAPPA RÁWEL, of whom two or three genealogical lists have been preserved in various inscriptions, some decyphered and explained by Mr. WILSON, in the *As. Researches*, vol. xv., and others by Colonel TOD. The latter authority enjoyed the advantage of filling up the history of *Mewár* from the national poems and traditions of the place; but it must be confessed, as strangely perplexing, that the names of the immediate predecessors of HAMIRA should be at total variance in the Hindu and the Muhammedan accounts. Thus, FERISHTA makes RAY RATAN SE'N the Rája of *Chitór*, who was taken prisoner at the sack of the fort, and who escaped through a romantic stratagem of his daughter, and continued to ravage the country until his nephew was installed as above stated in the masnad. Colonel TOD makes the name of the imprisoned Rája, BHÍMSI, and that of his daughter, PADMANÍ. The circumstances which led to the admission of the fair heroine into the hostile camp with her 700 litters, each freighted like the Trojan horse, are also differently related by the two authors. It will be a strong motive for the preference of the Hindu account, if the BHÍMA DE'VA of our coins can be identified with this BHÍMSI (*Bhima sinha*): but the short interval from his return to *Chitór* to the death of himself and his family in the sack which followed, would hardly allow the issue of a regular coinage in his name at such a turbulent period. The style also of the Nágari alphabet (the ञ *bh* especially) differs materially from that of HAMIRÁ's name. Yet there is no other *Bhíma* in the *Mewár* list. FERISHTA mentions one (*Bhím-dew*) as the brother of SHUNKUL DEW, the Prince of *Deogir*, contemporaneous with ALLA; but he does not seem to have attained the throne. In the collateral line of the *Gujerát* Rájās, the same name occurs thrice, the last in 1209, of whom the Moslem histories make frequent mention; but the insignia of this *Ráj* are of a distinct character, and will not admit of our transferring the bull and horseman device thither for an owner*.

* BHÍMA DE'VA of *Gujerát* was defeated by MUHAMMED GHÓRI' (or *Sámè*?) in A. D. 1178.

It provokingly happens that the nine rájas immediately preceding BHÍMSI, in Tod's list, are omitted as an uninteresting string of names; thus shutting out a chance of recognizing many of the petty names of our coin list. We must in consequence pass over *Dánapála dēva*, *Kripá*, *Vadásur*, &c. and retrograde to *Sámanta dēva*. This name is one of those on the inscriptions from mount *Abu* (*Arbuda*)*, the 18th of the *Guhila* family, to whom an actual date is also assigned, namely A. D. 1209. The objection to this is, like that to *Bhima*, that the date is too modern for the alphabetical type; moreover, from Tod we learn, that it was RAHUP of *Mewár* who was attacked by SHEMSH UL-DÍN (*Altamsh*), in 1210-20, and this name we have recognized in the more modern Nágari on several of the horseman coins.

There are other *Sámanta* (*Sinha*) *dēvas* in the *Anhulwára* line of *Gujerát* of an earlier period, both in the *Ayin Akberí*, and in the native chronicles; indeed, BANARÁJA himself, the founder of the *Chohán* race at *Anhulpur*, was the son of a SÁMANTA SINHA, fixed by Tod in A. D. 745: and it is worthy of particular note, that the first prince restored to the *Gujerát* throne, near two centuries after the overthrow of the Balhárás by the Parthians, is called in the *Ayin Akberí*, "SAILA DE'VA, who was previously living in retirement at *Ujjain* in A. D. 696." Now the name on the coin which I have assumed as the most ancient of the series, and therefore placed at the top of Plate XVI., is SYALAPATI DE'VA, a name apparently taken from the country where he ruled†; but which might easily be converted, either with or without intention, into S'AILA DE'VA, a title denoting dominion or birth among the mountains.

In conclusion, it should be borne in mind, that both the *Mewár* and the *Gujerat* lines are of one family, that of the *Gehlote* or *Sesodia* tribe, to which, though arrogating to itself a descent from the Sun, the Persian historians uniformly ascribe a *Parthian* origin. May not this be received as a good foundation for the Indo-Scythic device on their coinage; or on the other hand does not the latter fact, supported by historical tradition, go far towards the corroboration of the extra Indian origin of the *Mewár* dynasty?

Plate XLIX. *Sauráshtra* Coins.

In antiquity the present series doubtless should take precedence of those depicted in the three last plates; perhaps it should rank next to the *Behat* or *Buddhist* group, for it has an important symbol in common with them. My only reason for delaying to notice it until the last, has been the hopes of receiving a further accession of

* As. Res. vol. xvi. page 322.

† *Syalakoith*, the fort of *Syála* near the Indus, was once attacked by the armies of *Mewár*.

Hindu Coins. — Saurashtra Series.



specimens from Lieutenant BURNES, who lately forwarded me several coins, and afterwards wrote me that he had come on a further treasure of them in the course of some excavations in Cutch.

A few specimens of the new accessions, selected by Mr. WATHEN at Bombay, did not add much to the variety with which I had already become acquainted from the collections of KERÁMAT ALI and MOHAN LÁL, of Lieutenant CONOLLY, and especially of Colonel STACY. Some of these I have before made known: other varieties have been long since published in Colonel Tod's plate of coins in the Transactions of the Royal Asiatic Society, but there are many entirely new in the plate I am now about to introduce to my readers.

In the first place, however, I am pledged to prove that the type of this series of Indian coins is a fourth example of imitation of a Grecian original. The very style and beauty of the profile on some of the earlier specimens, (figs. 1, 3, 10,) might be enough to convince an artist or a sculptor of the fact, for we might in vain seek such accurate delineations of the human features on any genuine Hindu coin; witness the degradation to which the very same device soon arrives under its Hindu adoption. But a comparison with the coins of the *Arsakian* and *Sassanian* dynasties of Persia, which are confessedly of Greek origin, may go farther to satisfy a sceptic on this point. The mode of dressing the hair belongs exclusively to Parthia: none of the genuine Bactrians even have it, and in the whole of our Indo-Scythic acquaintance, it will only be seen on the medals of KODOS, engraved as figs. 11, 12, and 13, of Plate XXV. of the present volume. In him the likeness is perfect, and him, therefore, I would deem the progenitor of this *Sauráshtra* group, so similar in size, weight, metal, and contour of the head. The marked distinction between the two is confined to the reverse. Here a long Devanágari inscription, encircling a curious monogram, is substituted for the standing figure with his hitherto uninterpreted motto, MAKAP... ΠΑΗΕΡΟΥ.

Apropos of this seemingly impossible Greek combination; even while I am writing this passage, the explanation starts to my imagination, like an enigma or puzzle laid aside for an interval, and taken up by chance in a position in which its solution strikes palpably on the eye, and the wonder arises how it could have escaped detection at the first! It may be remembered, that in describing the various mottos on the reverses of the Kanerki and Kadphises group, in my last notice, I remarked a curious instance of the word OKPO "the sun," being changed into ΑΠΑΟΚΡΟ, "the great sun*."

* Mr. V. TREGGAR writes to me, that he has just met with a duplicate of the gold ΑΠΑΟΚΡΟ coin, plate L., fig. 6. It was stated to have been dug up by a pea-

Now AΘPO was also one of the original simple denominations of the same class, supposed to be of a like import with *Mithra*, or the sun. By the rule of mutations, the addition of APΔA or APTA, great, would lengthen the initial vowel of this word, or change it into an H, and produce the compound form APΔHΘPO, "the great *Athra*." Giving a Greek termination and putting it, as usual, in the genitive case, we shall have ΜΑΚΑΡΟΣ APΔHΘPOY, "of the blessed *ard-Athra*." This is the very expression existing on the coin, supplying only a single letter, A, which is cut off through the imperfection of the die. Here we have a happy illustration as well of the connection between the several groups and their respective objects of worship, as of the gradual and necessary development which these interesting researches are calculated to produce. Further, on conversing, this moment, with a pandit from the *Panjáb*, I learn that the sun is called in the *Pushtu* language, *Ait*, आित, or *Ayat* आयत; a corruption, he says from the pure Sanscrit आदित्य *Aditya*, whence may be derived in a similar manner *Ait-wár* or *etwár*, the common *Hindu* expression for Sunday. To all of these forms, the similarity of the *Zend* word *Athro* is obvious, and we need therefore seek no refined subtlety in admitting it to worship as the ethereal essence of the sun, since it can with so much more simplicity be understood as a common denomination of the solar orb itself. It should be remarked, that the effigy of APΔHΘPO, like that of AΘPO, has flames on his shoulders.

I will not stop to inquire whether the change from the Sanscrit OKPO (*Arka*) to the *Pushtu* or *Zend* AΘPO (*Aita*) has any possible connection with a parallel charge in the family designation of the *Sauráshtra* princes, who were in the first centuries of the Christian era marked by the affix *Bhatárka*, (cherished by *Arka*,) but afterwards, for a long succession of reigns, were known by the surname of *A'ditya*; but will proceed to describe the immediate contents of the plate now under review.

Figs. 1, 2, 3, are placed at the head of the series, because in them the head bears the nearest analogy to its prototype. In fig. 1, indeed, the letters behind the head may be almost conceived to belong to ΚΩΔΟΥ. In the centre of the reverse is the so called *chaitya* symbol ☸: which, had it only occurred on these descendants of a *Mithraic* coin, I should now be inclined to designate a symbol of the holy flame,

sant in the Juanpur district, along with 50 others, which were immediately committed to the melting pot. I may here take occasion to notice, that the pilgrim who sold the three coins of ΚΑΡΦΑΙΣΕS in the bazar of Benares was not a *Marratta*, but a native of the *Panjáb*.

trilingual and pyramidal, of the Sassanian fire-worship. The marginal writing may with certainty be pronounced to be an ancient form of Sanscrit; but I cannot attempt to read it. In figures *a, b, c*, I have copied the lines from three other coins, and have thus ascertained that a portion of the legend is the same in all, while the remainder varies. The former doubtless comprehends the regal titles; but in it there is no approach to the ordinary Indian terms of Rájá, Rao, &c. The six parallel letters may be read परहत्तपस.

Figs. 4 and 5, differ from the preceding in the central device, which now bears a rude resemblance to the human figure. The letters and general execution are very imperfect.

Figs. 6 to 9, are one step further removed from perfection. The legend where best preserved, as in fig. 9, appears a mere repetition of the letter *p*, with the suffix *r, ri*, and *y*. There are three letters behind the head in fig. 7, which may be taken either for corrupted Greek, or for the Pehlevi of the Sassanian coins, *olo*. The central symbol has the form of a trident. Lieut. BURNES informs me that several hundred of these three species of coins were found in Cutch in 1830 in a copper vessel buried in the ruins of *Puragark*, 20 miles west of Bhoj, a place of great antiquity, and yet marked by the ruins of a palace and a mint.

Figs. 10, 11, 12, are of a different type, though nearly allied to the former; they are not only found in *Gajráť*, but at *Kanouj*, *Ujjain*, and generally in Upper India. Lieut. CUNNINGHAM has just sent me impressions of five very well-preserved specimens procured at Benares, on which in front of the face are seen some letters very like the Pehlevi character, *α<ω*. The Sanscrit too is not of the elongated form of the upper group, but exactly like that of Mr. WATHEN's *Gujerát* inscriptions. Not having yet succeeded in decyphering them, it is needless to copy out the mere letters at present. The symbol in the centre will be recognized as the peacock, sacred to *Kumára*, the Mars of the Rájputs, alluded to in the preceding observations.

Figs. 13, 14, 15. The popular name for these rude coins, of silver and of copper, is, according to Lieut. BURNES, in *Gujerát*, "*Gadhia ká paisa*," Ass money, or rather, "the money of *Gadhia*," a name of VIKRAMÁDITYA, whose father JAYANTA, one of the *Gandharbas*, or heavenly choristers, is reputed to have been cursed by INDRA, and converted into as ass. WILFORD, in his Essay on the *Era of Vikramáditya*, endeavours to trace, in this story, the Persian fable of BAHRAM-GÔR's amours with an Indian Princess, whence were descended the *Gardabhina* dynasty of Western India, (*gardabha*, being, in Sanscrit,

equivalent to *gór**, an ass.) The story is admitted into the prophetic chapters of the *Agni Purána*, and is supported by traditions all over the country. Remains of the palace of this VIKRAMA are shewn in *Gujerát*, in *Ujjain*, and even at *Benares* ! the Hindus insist that this VIKRAMA was not a paramount sovereign of India but only a powerful king of the western provinces, his capital being *Cambát* or *Cumbay* : and it is certain that the princes of those parts were tributary to Persia from a very early period. The veteran antiquarian, Colonel WILFORD, would have been delighted, could he have witnessed the confirmation of his theories afforded by the coins before us, borne out by the local tradition of a people now unable even to guess at the nature of the curious and barbarous marks on them. None but a professed studier of coins could possibly have discovered on them the profile of a face, after the Persian model, on one side, and the actual *Sassanian fire-altar* on the other ; yet such is indubitably the case, as an attentive consideration of the accumulation of lines and dots on figs. 13, 16, will prove. The distortion of the face has proceeded from an undue relief being given by the die-cutter to the forehead and cheek : and this has by degrees apparently deceived the engraver himself, who at last contents himself with a deeply projecting oblong button, encircled by dots, (figs. 16—18) ! Should this fire-altar be admitted as proof of an Indo-Sassanian dynasty in *Sauráshtra*, we may find the date of its establishment in the epoch of YESDIJIRD, the son of BAHRAMGOR ; supported by the concurrent testimony of the *Agni Purána*, that VIKRAMA, the son of GA-DHÁRUPA, should ascend the throne of *Málavá* (*Ujjain*) 753 years after the expiation of CHÁNAKYA, or A. D. 441.

Fig. 17, is one of several very curious coins in Colonel STACY'S cabinet. The obverse shews it to be a direct descendant of 15 or 16, the "*Chouka-dúka*" of Colonel STACY ; while the Nágari inscription of the reverse is at once perceived to agree with the second, or *Gaur*, series of the *Kanouj* coins. I adverted to this fact before, and stated that it seemed to point to the paramount influence of the PÁLA family of *Kanouj* from *Gaur* in Bengal to *Gujerát*†. The inscription has the letters श्री सा. . . . लदेव probably *Śrī Sámanta* or *Sámara Pála deva*.

Fig. 18, is a more modern variety of the *Chouka-dúka*, on which the fire altar is replaced by Nágari letters of the eleventh or twelfth century. The reading appears श्री कौज *Śrī Kanja* ? but it is more probably श्री काल *Śrī Kála*, for we find a KÁLA DE'VA in the *Gujerát* list towards the close of the 11th century, whom WILFORD would identify with VISALA DE'VA of Delhi.

Figs. 19, 20. I have placed these two novelties from Colonel

* As. Res. ix. 155.

† See observations in page 682.

STACY's cabinet, in juxtaposition with the *Sauráshtra* group, because we see in them the evident remains of the fire-altar device of figs. 13, 15. The body of the altar only is removed and replaced by the Sanscrit श्री *Srí*; the opposite face has the very legible letters ह्रासस् ५० and ५१ *Hrásas*, 40 or 41. The explanation of ह्रासस् in WILSON's Dictionary is "the moon (in the language of the *védas*);" but it would be hazardous to interpret *Srí Hrásas*, as indicative of a lunar worship, or an adoption of a lunar motto, in contrast with the solar effigy and the fire emblems that preceded it. श्री *Srí*, by itself, is still impressed upon the *Sháh-Alem* coin of *Málwá*, which is denominated from this circumstance the *Srí-sáhy* rupee*. It is an epithet of the goddess LAXMI', and denotes pure Hinduism in the reigning dynasty.

Hrás, taken separately, may be a contraction of *Hástinapur*, or *Hánsí*, the place of coinage, and स ५० may be *Samvat* 40 or 41, the year of reign.

Figs. 21 and 22, should rather have found a place among the *Pála* coins of *Kanouj*; for on the reverse of both, sufficient of the *Gaur* alphabetic characters are seen to enable us to fill up the whole reading as श्री अजय देव *Srí Ajaya dēva*. The obverse seems to be a rude outline of a horse or a bull.

At the foot of this plate I have inserted a few miscellaneous coins, which I was doubtful where to place with propriety, or which have reached me since the foregoing plates went to press.

Fig. 23, is in Colonel STACY's collection, a brass coin of unique appearance; on the obverse, a seated figure, adorned with a glory; on the reverse, an urn containing flowers, and across the field, in the ancient form of Sanscrit वगुपति *Vagupati*; around the margin, on both sides, is a garland of roses.

Fig. 24, is a recent accession to Colonel STACY's collection: on one side a bull and staff, with the unknown word ॠॡॢॣ; on the other side, the peacock of *Kumára* and a palm tree? This coin is evidently allied to those found by Mr. SPIERS, in the Allahabad district, and figured in Plate XXVI. of vol. iii.; two of them are here re-engraved as being more in place. Lieut. CUNNINGHAM has a duplicate of 25, with a fuller inscription in the Allahabad form of *Nágari*; I shall take a future opportunity of engraving it.

Fig. 27, is a copper coin found in the parcel lately received from Syed KERÁMAT ALÍ'. It is remarkable for containing the motto of the Rajpút series श्री समग्र देव *Srí Samagri (or Samanta) dēva*, with an elephant instead of a bull; while on the reverse, the rude outline of a horse without rider seems encircled by a Pehlevi legend; a coin

* See Useful Tables, Part I.

nearly similar was engraved in the plate of Lieutenant BURNES' coins, Plate XI., fig 17, page 318 of vol. ii.

Fig. 28, from the same source as the last, is also nearly a duplicate of *fig. 14*, of the above plate, except that it has the *sinha*, a lion, for reverse, instead of the horse; the letters correspond exactly, but though individually distinct enough, I can make nothing of the context.

With these I close my present notice, not I fear before I have tired out many of my readers! and it is with some compunctious feelings towards all but the few whose zeal in the cause of Indian numismatology equals or surpasses my own, that I announce my having received fresh materials, from various quarters, wherewith to revive the subject in the ensuing year. Mr. MASSON's second memoir must also find a place in the January number. On some future occasion I hope to be able to strike off a fresh edition of the coin plates, and to gather all that has been written on the subject, into a distinct volume, when the train of discovery shall begin to relax, and the materials scattered through the pages of the journal may be supposed to comprise most of the varieties of the ancient coins of India*.

IV.—*Geological Observations made in a journey from Mussooree (Masúrí) to Gungotree (Gangautrí). By the Rev. R. EVEREST.*

Mussooree is situated upon the outermost ridge of the *Himálaya* mountains, which these ranges is made from N. W. to S. E. nearly, and presents a bold escarpment towards the valley of *Dehra*, or the *Dún*, above which it rises to the height of nearly 4000 feet.

This ridge consists of beds of compact limestone alternating with others of a soft slate with an earthy fracture, and exhibits certain characteristics, both in its mineral structure and in its general outlines, analogous to the transition limestone of the north of Europe, and the mountain limestone of England. Its most general colour is bluish black, and from this it passes through grey to greyish white, and again, on the other side to perfect black, not differing there from the *lucullite*, or compact black marble (as it is called). It is carboniferous: it is highly cavernous. Many varieties emit a fœtid smell, probably of sulphuretted and carburetted hydrogen: indeed where the rock is quarried, the smell is similar to that at the mouth

* I issue with the present number a continuation of the Appendix of "Useful Tables," containing Genealogical Tables of the principal Hindu dynasties, which will assist the reader very much in understanding the allocation of the various series of coins described above: the tables were formed principally with this view.

of a coal-pit. These carboniferous or coaly varieties have, however, one peculiarity. They are in some places highly vesicular, so much so as to resemble a grey lava; and in this state appear to have partially suffered from the action of heat. Mr. FISHER, in his account of the Mussooree limestone, (see GLEANINGS for May, 1832, p. 194) states that it is "highly crystallized," but I did not meet with any such rock during my stay in the neighbourhood, nor see any specimens of it.

The slate that alternates with the limestone is of various colours, bluish black, grey, greenish grey, brownish red, purplish, and yellow. It is generally soft, and crumbling, and will not split into large plates: but about two miles west of the station, below the peak called *Háti-paon* and nearly half way down the hill, a bluish black variety is found, hard enough to be used as a roofing-slate. Somewhat to the west of this, on the *Dudhillee* hill (a station of the Trigonometrical Survey), a trap rock makes its appearance. It is to be met with at the bottom of a small water-course, and may be traced for about half a mile in a direction nearly parallel to the range of the mountains. It is composed in some parts principally of compact white felspar and green diallage, in others principally of hornblende. It was not possible to trace the manner of its connection with the adjacent strata, which are evidently much disturbed, though they had not suffered any change in mineral character by contact with it. Probably it has cut through them as a dyke, and the continuation of it may again be met with about a mile to the eastward, where a black heavy trap is to be seen, containing crystals of bronzite imbedded. The general range of these alternating beds of slate and limestone appears to be nearly parallel to that of the direction of the mountains, but not exactly so, as it approaches somewhat more to a north and south line, the dip being a little to the northward of the east, and the angle of it from 20° to 30° . The slopes are very steep, usually covered with a luxuriant vegetation, and remind us of those in Cumberland and Derbyshire, though, of course, on a much larger scale. In the Mussooree rock, however, there is a great deficiency of mineral veins. As we travelled eastwards from Mussooree to Landour, we found, a short distance beyond the hospital, quartzzy-sandstone, of a white and greyish colour lying upon the soft, earthy slate. This appearance continued four miles further on to Soakolly, the quartzzy-sandstone capping the peaks, and the slate underlying it. From Soakolly we descended for several miles, in a N. N. E. direction, over alternating beds of quartzzy-sandstone and slate, to the Agilwar river, which runs with a westerly course to the Jumna. The slate,

which alternates with the quartzzy-sandstone, often becomes a distinct grey-wacke, consisting of a greyish green base, with numerous angular fragments of clay-slate imbedded. No such appearances could be observed in the slates which alternate with the Mussooree limestone, and this circumstance, coupled with that of superposition, seems to mark the quartzzy-sandstone as the newest formation of the two.

To the north of the Agilwar, we passed over one more ridge of apparently similar composition to the one just described, and then descended into the valley of the Ganges. This valley, where we came upon it, is full a mile broad, and exhibits at different heights, say from 2 to 300 feet above the present level of the stream, flat terraces of gravel, containing boulders, from the size of a pumpkin downwards, perfectly similar to what form the present bed of the river. These appearances continue all the way to its source. In the bed of the river and the precipitous banks that enclose it, we found strata of blue slate, hard and splitting into large plates, uniform in colour and general character, and inclined at a considerable angle to the N. E.—a slate widely different from the soft and parti-coloured varieties, that alternate with the limestone of Mussooree. As we advanced northwards, where our road led us to a considerable height above the river, we met again with a limestone and slate similar to that at Mussooree, and the overlying quartzzy-sandstone, apparently capping all the heights in the neighbourhood. At the end of our second day's march along the course of the river, the quartzzy-sandstone had become the predominant rock, and the slate had nearly disappeared, being only found in the lowest ground opposite Ballahaut. The line of junction of the two was seen only a few feet above the level of the river. Somewhat before this, the slate had partly assumed the character of talc-slate, having a faint glimmering lustre, and a soapy feel. Beyond Ballahaut we continued travelling near the line of junction of the two formations, the slate gradually passing into a perfect talc-slate, and the quartzzy-sandstone becoming rather more crystalline than before. Perhaps the name of quartz rock might be more appropriate to it, though it still exhibits in some places traces of round grains agglutinated together. About Batwaree, two marches in advance of Ballahaut, the quartzzy-sandstone ceases on the low ground and the slate contains a mixture of quartzzy and felspar, forming a talcose gneiss, with hornblende occasionally intermixed. Traces of the quartzzy-sandstone yet remain upon the cliffs above for some miles farther to the north, where a gradual passage of it may be observed into the talcose gneiss. We found this talcose gneiss for two marches further to the north, containing, however, at times a

good deal of mica, and, rarely, garnets. The valley in which the river flowed had become narrower day by day, and was now nothing but a channel of the breadth of the water course, from which cliffs nearly perpendicular rose, on either side, to the height of several thousand feet, shewing a section of the different beds from the top to the bottom. The rock was evidently approximating to a real gneiss, but it was not until the third day's march from Butwaree, between Daugal Dhurmsála and the village of Sookee, that a gneiss and mica slate formation appeared in its usual features of grandeur, and with its usually-accompanying minerals. Here the river flows in a cut through a ridge, which to the west forms the snowy peaks from which the Jumna takes its rise, and continuing to the east, always above the line of forest, and often far above that of perpetual snow, runs to the south of the temple at Gungotree. Bare precipices, thousands of feet in height, and pinnacles thrust into the sky—those characteristic pinnacles which in other countries have received the names of *horns*, *spids*, and *aiguilles*, and here are called by a term of similar import, *kantas*, present themselves prominently to our view—and as we climb over the ruins below, among blocks bigger than houses, by the side of which the foaming river runs, we find a well-defined gneiss and mica slate, with kyanite and garnet imbedded. A thin stratum of coarse-grained snow-white marble was also seen. On approaching the village of Sookee, white layers and veins were seen in the cliffs that overhung us. They were composed of a coarse-grained granite, containing crystals of black tourmaline imbedded. This granite is seen in the mass a short distance further on, where the river takes a sharp turn to the eastward towards Diláree. Here the precipices on the northern bank were composed of mica slate overlaid by a rock, the rounded outlines and bare ruggedness of which indicated granite. About a mile beyond Diláree the line of junction changes from the horizontal to the vertical. Both rocks may be traced in contact for several hundred feet upwards, but the slate does not appear to have been at all disturbed by contiguity of the granite. The dip is here, as it has been throughout the whole of our journey, between N. and E., with little or no variation. We met with granite further on, all the way to Gungotree—granite often having mica rarely, and acicular crystals of black schorl abundantly imbedded. Yet, besides the ridge of snowy “*aiguilles*,” which runs three or four miles to the south of us, and peers everywhere above the intermediate rocks, another similar one is seen to the north of us, which meets the first at an acute angle, a short distance beyond the temple at Gungotree. Both these ridges, from their peculiar outlines, must be

of mica slate, or gneiss. We find too on our way masses of slate several feet across lying in the granite, and pieces again of the size of a brick, as if they had been imbedded in it in a state of semifusion, so as to form an irregular gneiss. But these appearances are only partial. This granite appears to range in nearly an east and west line. We have crossed three different masses of trap on our journey, besides the diallage rock, I mentioned, to the west of Mussooree, viz. one on the ridge before descending into the valley of the Ganges, and two others in the clay-slate, and talc slate. We could not, in either case, trace their connection with the surrounding rock: but we probably crossed them at nearly a right angle, and, if so, their ranges must approach to a parallel with that of the granite. They had all the characters of a common greenstone. From Gungotree to Diláree, the river runs through a gloomy chasm in the granite; the branch from Gungotree has rather a dingy hue, but the northern one called the Melung, that comes from Tartary, is, indeed, a beautiful water—as blue as the Rhone when it issues from the lake of Geneva. As the stream becomes larger below Sookee, it is a grand and singular object—with a body of water as great as that at the falls of Schaffhausen, perhaps much greater, it preserved the appearance of a mountain brook during the whole of the time we saw it. There is no perpendicular fall, but the slope is so great that it tumbles and foams over the rocks for the entire distance.

To recapitulate the rocks observed in the order of succession, they are—1, granite; 2, gneiss and mica slate; 3, talcose gneiss and talc-slate; 4, clay-slate; 5, Mussooree limestone; 6, quartz-rock, or rather quartz-sandstone, and grey wacke slate.

The relative position of these two last, however, needs farther investigation, for there are undoubtedly seams of quartz-sandstone alternating with the Mussooree formation; one in particular, several feet in thickness, may be observed near the bottom of the hill, just above the village of Rájpoor.

V.—*Note on the Fossil Camel of the Sub-Himálayas.* By Lieut. W. E. BAKER, *Engineers.*

With reference to a doubt expressed in your Journal for September, the specimens of “*Camelidæ*” now in our possession, will, I hope, be sufficient to establish the existence of that genus in the fossil state.

They are: A cranium, with portions of both rows of upper molars, shewing also the occipital and parietal bones, so peculiar in the camel.

A fragment of upper jaw with molars.

Two fragments of lower jaw with molars.

The upper and lower extremities of a metacarpal bone (the central piece wanting).

The lower extremity of a radius.

In the above specimens, I have been unable to detect any point of difference from the camel of the country, with which also they appear to correspond in size. The cranium, however, has not yet been cleared from the matrix, which *may* conceal some distinctive mark.

The existence of fossil *Capridæ*, (in which I include antelopes,) is established by numerous specimens of teeth and jaws, and several heads, more or less perfect; these, with the *Cervidæ* and *Bos*, nearly complete the *known* varieties of ruminant of the larger unknown genera: we have yet much to learn.

I have lately seen a nearly perfect fore-leg (consisting of the humerus, radius, cubitus, carpus, metacarpus, and one phalanx), of a ruminant which must have united the height of the camel with the proportions of the bos, judging from the great excess in length of radius compared with that of the humerus and metacarpal bone. Of a similar animal we possess chains of vertebræ, cervical and lumbar, at present buried in matrix; should their clearance determine any interesting point, I shall not fail to communicate it.

Of rhinoceros remains, we have now a plentiful and most interesting collection, comprising, besides teeth, heads, &c., more numerous perfect bones than of any other animal.

Our latest acquisitions are teeth and jaws of the porcupine and rat, several fragments of *fish* with their *scales beautifully* perfect, and a small species of felis about the size of the jungle cat.

P. S. Your fig. 19, Pl. XXXIII. vol. iv. appears to me the upper articulating surface of an axis of horse or camel, whether the former or latter might be judged by the size.

I make this guess, from the appearance of the angle with which the pivot rises out of the flat articulating surface.

In the bullock, antelopes, goat, sheep, and stag, the rise is nearly perpendicular: in the horse or camel, it has a concave shape. Fig. 19, is apparently much interwoven; the axis which I have supposed may belong to the elk*, is not in its proportions similar to the corresponding bone of the camel, but belongs to an animal with a shorter and thicker neck.

* See plate XLIV. and page 506.

VI.—*Examination of a Mineral Exudation from Ghazni.* By H. PIDDINGTON, Esq.

[Among the specimens of minerals and drugs received from SYED KERA'MAT ALI, and collected by him while on Government employ in *Cábul*, as noticed in the Proceedings of the Asiatic Society, 7th October, 1835, a bottle containing a mineral exudation from Ghazni excited attention; it was labelled by Lieutenant CONOLLY,

“*Rock Chetny which, according to the Syed's informant, oozes out of a fissure in a rock at Ghizni. Native appellation Mumia? A. C.*”

Having placed this in Mr. PIDDINGTON's hands for chemical analysis, we now hasten to publish the account he has been so kind as to draw up of the results of his examination.—ED.]

I.—*Description.* An unctious, viscid mass, semi-transparent, of a dirty light-brown colour, interspersed with small dark-brown and black specks; and mixed with angular fragments of calcareous rock, varying from the size of a lentil to that of a horse-bean.

The smell faint and sickly, and very peculiar. The taste pungent; when diluted with water sickly.

II.—*Tests.* 1. Solution in cold distilled water is turbid and clogs the filter; does not affect litmus or turmeric papers.

2. When boiled the same. The residue contained calcareous stones with a little siliceous matter, and a coarse bran-like powder, which when freed from the calcareous matter by dilute muriatic acid, proved to be the remains of half decomposed dung; evidently, by comparison with fresh dung, that of birds, and probably of pigeons or bats, &c. I recognised in it minute fragments of straw, pith, shells of seeds, &c. The brown and black specks were minute seeds, quite perfect, or fragments of a carbonaceous looking crust.

3. Boiled in highly rectified alcohol, silky crystals were left in the mass, which was now tough and pasty: these crystals were nitrate of soda. The alcohol evaporated was found to yield nearly pure nitrate of lime, mixed with a little fatty and very foetid animal matter.

4. The solutions were tested by—

Oxalate of ammonia, giving plentiful precipitate. Lime.		
Muriate of barytes; }	slight cloud.	{ Trace of sulphates and muriates.
nitrate of silver; }		
Sulphuric acid to }	{ nearly solidified }	{ Nitric acid.
concentrated solution; }	{ it, and evolved fumes of nitric acid. }	
Gold leaf boiled in solution, with a little muriatic acid added; }	dissolved.	Nitric acid.
Muriate of platina; }	no effect.	No potass.
Tincture of galls; }	no effect.	No iron.
Nitro-muriate of gold, }	no effect.	No albumen.
Deuto-chloride mercury; }		
Tannin; }	no effect.	No gelatine.

To the chemist some of this may look superfluous, but I was always suspicious (and thought the fact worth ascertaining), that this singular looking compound might be artificial.

On platina foil, before the blow-pipe, it tumifies with strong effervescence, blackens, decrepitates with minute sparks, and passes into a whitish mass. The platina scarcely affected.

The bran-like matter left from the aqueous and muriatic solution, No. 2, was heated in a tube in which litmus and turmeric papers with a bit of silver foil were so disposed, that the vapour from the assay would pass over them. When heated, a strong ammoniacal (burnt feather) smell was evolved, followed by a sickly odour like that of turf, or tan refuse. The upper part of the tube was browned as from turf smoke. The silver foil and test papers were no way affected, proving the absence of sulphur or matters affording ammonia in this residuum.

Analysis.

In a compound necessarily so variable, little more satisfaction was to be expected from an analysis than the test afforded, saving that of being convinced that nothing had been overlooked; 400 grains of it gave

By alcohol and water, { Nitrate of lime, with a little fatty animal matter, }	162·5
Nitrate of soda,	23·5
By muriatic acid, Carbonate of lime, from the rocky fragments,	136·5
Water by an independent experiment,	62·0
Residuum of dung of birds, with a very little siliceous matter and sulphate of lime, }	9·5
	<hr/> 394·0
Loss,	6·0
	<hr/> 400

Assuming the information on the label to be correct, we may suppose that the fissure from which this "rock Chetny" oozes communicates with some limestone cavern frequented by birds, (or in which are large deposits of animal matter,) from which or from the decomposition of the dung, as in many similar situations, the nitrates of lime and soda are formed and gradually ooze out. The presence of the vegetable remains and the absence of all traces of bitumen or sulphur, quite exclude the idea of its being "*Mumia*," as suggested on the label. I have somewhere seen it mentioned, that a nitre cave, as they are commonly called (I think in Kentucky), produces a matter assuming this unctuous, but not the viscid, state, but cannot now recollect the work.

VII.—*Corrected Character of the Genus Cuvieria of RANG, and notice of a second species inhabiting the Tropical Indian Ocean. By W. H. BENSON, Esq. B. C. S.*

In my catalogue of Pelagian shells, vol. iv. p. 176, I mentioned that the capture of perfect specimens of the Pteropodous genus *Cuvieria* would enable me to correct the characters given by RANG, in his Manuel, from shells met with in the imperfect state in which they are usually found. I now redeem the promise implied in that communication. The following is the corrected character.

Cuvieria (RANG). Testâ symmetricâ, anticè subcylindricâ, posticè elongato-conicâ, apice acutissimo, medio septo tenui, imperforato, concavo, versus apicem convexo, concameratâ; aperturâ suprâ depressâ, subcordiformi.

RANG gives as a character “ le côté opposé à l’ouverture fermé par un diaphragme convexe à l’extérieur, non terminal, étant débordé par les parois du cylindre;” and this is the general appearance of the shell, which in the numerous specimens captured by us, was, with the exception of two individuals belonging to the smaller species hereafter described, defective in the conical termination. One of these two, taken in my tow-net, I broke on extracting the animal; the other, which was secured by Lieut. HATTON, H. M. 62nd regiment, was kindly presented to me by him.

The ordinary condition of *Cuvieria* appears to be analogous to the truncation observable in *Bulimus decollatus*, and in some of the *Melania*, in which the part excluded by a diaphragm is liable, from the loss of vascular connexion with the inhabited part of the shell, to become brittle and deciduous.

The larger species, *C. columnella* of RANG, the only recent one hitherto observed, is that which is most widely distributed, and was met with by us in the Southern Atlantic, as well as in the Southern Indian Ocean. The range of the smaller species, which differs in being about half the length of the other, and in being somewhat more depressed, and more ventricose laterally, appears to be more confined. I shall describe it from its resemblance, in its ordinary mutilated state, to a grain of rice, as

C. Oryza. Testâ lævi, intidâ, depresso cylindrica, lateribus versùs septum ventricosioribus; apice elongato, peracuto.

Length $\frac{1}{10}$ of an inch, of which the spire occupies nearly one-half. Taken, from the 15th December, 1834, to the 1st January, 1835, in a tract of the Tropical Indian Ocean contained between the parallels of 8° 6' south and 5° 0' north, and between the meridians of 86° 38' and 91° 0' east from London.

VIII.—*Synopsis of the Vespertilionidæ of Nipal.* By B. H. HODGSON,
Esq. Resident at Katmandú.

I have the pleasure to forward to you herewith the names and characters, which I have provisionally affixed to the *Vespertilionidæ* of the central region of Nipal. Without access to large museums and libraries, it is scarcely necessary to observe that the naming and defining of species can be but very imperfectly performed.

RHINOLPHUS.

* Prosth. memb. sup. transversa. adpressa. Sinu frontali.

Rh. armiger, mihi. Bright brown, with darker membranes. Frontal sinus round, and furnished with a pencil of hairs. Nasal appendage very large quadrate, adpressed, skinny in the lower part, fleshy in the upper, shaped like a coat of arms, with double field; the superior and inferior fields separated by two parallel, subtrilobate ridges, whereof the upper is fleshy like the proximate field. The lips with a triple fold of skin on each side. The antitragus vaguely developed, and wavily emarginated. Snout to rump, $4\frac{1}{2}$ inches; tail $2\frac{1}{4}$; expanse, 22; weight 3 oz. Females and young males, of a duller, deeper-toned brown.

* Prosth. memb. sup. erecta. haud sinu frontali.

Rhinolphus tragatus, mihi. Uniform deep brown, with the lips paler and rusty. Of the nasal appendage, the upper salient process is like a barred spear-head (‡), and the lower like a raised door-knocker. Antitragus considerably developed, so as to form a semi-circular mock† oreillon, whence the trivial name. Lips simple, $2\frac{3}{8}$ inches in length; the tail $1\frac{7}{8}$; expanse, $15\frac{1}{2}$; weight 2 oz.

Remarks.—Both the above species have the pubic teats strikingly developed. In form they are just the same as the true or pectoral teats, and in size, even larger than the latter. At their bases is a distinct indication of a gland, under the outer coat of the animals. The ears of both species are ‘tremblingly alive all over,’ and capable of considerable movement and compression, whence perhaps the transverse striæ or rays by which they are distinguished. In both species, there is some appearance of tragal and antitragal development. In *tragatus* (rectè anti-*tragatus*), the latter is prominent. These animals have manners nearly similar to those of the true *Vespertilio*s. So soon as it is dark, they come forth from the cavities of rocks, in groups, to skim the surface of standing crops, or to glide around and between umbrageous trees, in search of nocturnal insects, which

† N. B.—The true oreillon, peculiar to *Vespertilio*, is an enlargement of the tragus.

constitute their sole food. They make their exit rather sooner than the true bats, and always in considerable numbers. They are not migratory, nor subject to hibernation. They breed once a year, towards the close of summer, and produce two young, differing from the parents chiefly in the very restricted development of the nasal appendages.

PTEROPUS.

* Ecaudatæ.

Pt. leucocephalus, mihi. Whole head and neck, with the body below, rufous yellow; face, as far as the eyes, the body above, and the membranes, deep brown. Snout to rump, 10 inches. Expanse, 46. Weight, 22 oz.

* Caudatæ.

Pt. pyrivorus, mihi. Wholly of an earthy brown; nude skin of lips, of joints, and of toes, fleshy gray; tail very short, with its base enveloped in the interfemoral membrane, and its tip free. Snout to rump, six inches; tail, half an inch. Expanse, 24 inches. Weight, 5 oz.

Remarks.—The Pteropi never appear in the central region of Nipal, save in autumn, when they come in large bodies, to plunder the ripe fruit in gardens. The lesser species is a perfect pest, from the havoc it makes amongst the ripe pears. Hence I have called it pyrivorus. These animals are never seen in Central Nipal, save at midnight, at which time they come to feed, and necessarily from a very considerable distance. In the plains it is noted of them, that they will travel 30 or 40 miles, and as many back, in the course of a single night, in order to procure food.

VESPERTILIO.

V. formosa, mihi. Entirely of a bright, soft, ruddy yellow, with the digital membranes triangularly indented, blackish. Head, conical; face, sharp; muzzle and lips, confluentlly nudish; the former, anteally grooved, not above; outer and inner ears acutely pointed, moderate, less the head; teeth $\frac{2.2}{6}$ $\frac{1.1}{1.1}$ $\frac{6.6}{6.6}$ snout to rump, $2\frac{1}{2}$ inches; tail, 2; expanse, $12\frac{1}{2}$.

V. fuliginosa, mihi. Wholly sooty brown. Ears, lips, and muzzle, as in the last: and face sharp, but the rostrum somewhat recurved, owing to the concave bend of the nasal bones, which in *formosa* are rather convex. Teeth $\frac{2.2}{6}$ $\frac{1.1}{1.1}$ $\frac{5.5}{6.6}$. In size somewhat less than *formosa*.

V. labiata. Thick-lipped Bat, mihi. Head broad and depressed, with a bluff physiognomy, and all the organs placed low down on the sides of the head; muzzle, small, clearly defined, rounded, grooved; lips very tumid, but not warty nor nude; ears shorter than the head,

remote, erect, spheroidal: auricle of the same form, and directed towards the conch of ear; posterior margin of the helix folded outwards, and carried forwards to the gape.

Saturate brown throughout. Skin, wherever denuded, purpure-scent. Teeth $\frac{2.2}{6}$ $\frac{1.1}{1.1}$ $\frac{6.6}{6.6}$; snout to rump, three inches; tail, two; expanse 15.

Remarks.—The bats remain with us throughout the year, and do not hibernate. They quest for food solitarily, and therein chiefly their manners differ from those of the Rhinolphi. Labiata is closely affined to M. GEOFFROY'S Noctula, and has a very different physiognomy from the other two species, which have both a sharp visage, though their crania exhibit in the facial part a considerable diversity, In Formosa, the nasal bones are slightly convexed in their length, and unite easily with a low forehead: in Fuliginosa, the same bones incline to a concave bend in their length, and join a high forehead, with a considerable curve.

IX.—Note on the Red-billed Erolia. By the same.

With reference to the paper on the Red-billed Erolia, published in your No. for August, I beg to acquaint you that I have been induced to adopt a new genus for this bird, and that the change of the generic has led me to the alteration of the specific name also. As I am no friend to the multiplication of names, I would observe, that in adopting a new genus, I have been governed by these two circumstances—1st, that VIELLOT'S genus Erolia has been rejected; 2nd, that GOULD'S genus Ibidorhyncha is inaccurate. I have had opportunity to examine three specimens, and from careful comparison of them, have drawn the following generic character.

GENUS CLORHYNCHUS.

Rostrum omnino Numeniaceum: differt tamen tomis inflexis denticulatisque, necnon apicibus acutiusculis.

Corporis, alarum caudæque forma sicut in Grallatoribus typicis.

Tibiæ et tarsi sub-breves, tibiæ trans medium plumosæ, teres: tarsi leviter reticulati.

Pedes tridactyli typicè cursorii, marginibus tamen digitorum subdi-latis, externoque digito libero.

Species nova. Cl. *Strophiatius*, Anglicè *Gorgeted Clorhynx*.

Cl. corpore supra, colloque plumbeis. Caudâ pallidiore, fasciisque nigris transversim instructa. Corpore subtus albo. Capitis vertice, facie, guttureque nigris. Pectore strophio nigro ornato. Iridibus rostroque sanguineis. Pedibus purpurecente griseis.

Synonyma. *Red-billed Erolia* of Asiatic Journal. *Ibidorhyncha Struthersii* of GOULD's Century.

The denticulation of the bill, and the strictly cursorial character of the feet, (with short, stout, very unequal, full, solid toes, and depressed truncated nails,) constitute, I conceive, *the* marks of this genus.

The species is 16 inches by 30 in length and extent, and 10 oz. heavy.

The intestines are 20 inches long, larger above than below, tough, frequently semi-convolved or doubled, syphonwise, and at three inches from the anal end, they have two cæca, nearly two inches in length, each of them.

The stomach is small, but very muscular and gizzard-like, and the food of the species, chiefly, minute univalve mollusca, which it picks up on the sandy margins of rivers and streams. In such sites it is usually found; nor does it appear to be gregarious.

The generic name *Clorhynchus*, is derived from *Clorios*, a Greek term for the curlew. The trivial name bears reference to the conspicuous gorget borne on the bird's breast. Had the former specific name (red-billed) been retained, there must have been tantological intrusion on the generic style, upon turning the specific appellation into Latin or Greek: hence the change.

Time and the discovery of more species will prove whether my generic character be worthy of retention. Quoad the single known species it is, I hope, both accurate and distinctive.

X.—Description of the little Musteline animal, denominated *Káthiah Nyúl* in the Catalogue of the Nepálese Mammalia. By B. H. HODGSON, Esq. Resident at Katmandu.

Genus.—*MUSTELA*.

Sub-genus.—*Putorices*.

Species new. *P. Káthiah*, mihi. The *Káthiah Nyúl* of Nepal. Habitat, the Kachár or Northern region. Specific character, deep rich brown above, golden yellow below, chin whitish. Tail, limbs, and ears concolorous, with the body above. Tail cylindrico-tapered, and half the length of the animal. Snout to rump, 10 inches; tail (less hair) 5 inches.

This beautiful little creature is exceedingly prized by the Nepálese for its services in ridding houses of rats. It is easily tamed; and such is the dread of it common to all murine animals, that not one will approach a house wherein it is domiciled. Rats and mice seem to have an instinctive sense of its hostility to them, so much so that

as soon as it is introduced into a house, they are observed to hurry away in all directions, being apprised, no doubt, of its presence by the peculiar odour it emits. Its ferocity and courage are made subservient to the amusement of the rich, who train it to attack large fowls, geese, and even goats and sheep. The latter, equally with the former, fall certain sacrifices to its agility and daringness. So soon as it is loosed, it rushes up the fowl's tail, or goat's leg, and seizes the great artery of the neck, nor ever quits its hold till the victim sinks under exhaustion from loss of blood.

The Káthiah has the true vermiform structure of the typical musteline animals; its head, neck and body forming a continuous equable cylinder. Its action is purely digitigrade, and even the palms and soles of its extremities are clad in hair beyond the limits of the lines defining the digits, and the balls supporting them and the wrists. The fore and hind legs are of equal and moderate thickness; but the hands are rather larger than the feet: both quinquidactylous, with the thumbs or internal digits a little withdrawn, as in the human hand. Of the rest of the digits, the two central are equal, and the two lateral, sub-equal, especially in the hinder extremities. Four oblong conjunct balls support the bases of the digits, and two the palms, an outer large ball of an elliptic shape, and a tiny round one its inner side. No metatarsal balls exist in the hind feet. The digits are more than half involved in a dilatable membrane which spreads freely to aid grasping. The talons or nails are all of sub-equal size, compressed, curved, and acute, suited to scansion and tearing, but not so well to digging. The fur is short, shining, and adpressed; that of the tail being a little larger, but not much so. The tail itself (i. e. exclusive of the hair which projects beyond its termination) is just half the length of the animal, and is slender, round and tapering. The head oval, with a short conical face ending in a clearly-defined round muzzle, having the nostrils entirely to the sides. The eyes are prominent, with round pupils, and they are seated much nearer the snout than the ears. The hairs issuing from the lips, cheeks, chin, and brows, are not rigid or thick; and a slight tuft of a similar character is set on above each carpus, as in some of the squirrels. The ears are lateral, transversely developed, formed upon the general model of the human ear, and more nearly of that of the mungoses. There is helix and antihelix, tragus and antitragus; but no lobe. Those who are familiar with the structure of the ears in the common Indian mungoose (*Herpestes Griseus*) will understand the exact form of the same organs in our animal, when I tell them that the only differences consist in the helix of the latter being more exserted, but not pro-

duced anteaally towards the eyes, nor reflected on the edge. The helix too, is entire in the mongoose; whereas in the Káthiah weasel, it has a large simple fissure in the posterior part, resembling that of *Martes Flavigula*. The front teeth stand free of the canines in the upper jaw, in contact with them in the lower, wherein the intermediate ones are ranged rather within the line of the rest of the teeth. Molars, $\frac{1}{2}$. The great carnivorous tooth in the upper jaw has a small flatish heel on the internal side, placed forwards, and at the base of great cutting process. The same tooth in the lower jaw has no transverse or lateral process; but the third longitudinal tubercle is nearly flattened on its crown, and the hindmost or fifth tooth in this jaw is small, and nearly flat-topped. The hindmost or fourth molar of the upper jaw runs transversely, and has two obtusely-conical points.

A horrible offensive, yellowish grey fluid exudes from two openings, placed laterally just within the sphincter ani. The scrotum is nearly without hair, and not larger (including the testes) than a marrow-fat pea. The omentum as delicate as a spider's web, and without a particle of fat.

The liver divided into six lobes. A small pea-like gall-bladder is deeply imbedded in the largest lobe. The stomach is nearly pyriform, and purely membranous; the œsophagus entering it close to the fundus. Length of stomach, $3\frac{1}{4}$ inches; greatest diameter, $1\frac{1}{2}$ inch. Spleen, $1\frac{3}{4}$ inch long, $\frac{1}{8}$ th of an inch in diameter. Coats of stomach thin, almost transparent. Entire length of intestinal canal, four feet, of uniform calibre, from the pylorus to the vent. No cæcum. Length of animal from snout to vent, 10 inches. This gives less than five times the length of body to the intestines. Lungs, six lobes, four right, two left.

XI.—Further Discovery of Coal Beds in Assam. By Captain F. JENKINS.

[Extract of a letter, dated Goalparah, 5th December, 1835.]

I wrote you sometime back that we had fallen upon a shell limestone in the *Nowgong* district, similar in all respects to that of Sylhet; there was every reason, therefore, to suppose, that we should find coal associated with the limestone, as to the south of the *Khásia* hills, and I have just now the satisfaction to report that this has been realized, and to send you small samples of coal that has been sent down to me by Ensign BRODIE. If I am not mistaken from the appearance, it will turn out to be a valuable and highly bituminous coal, and I shall be much obliged by your reporting upon it. A large

supply of it has been brought down for me to *Gowahatti*, from which, on my return, I will dispatch a good quantity to you. Of course what we have now to show are merely chance pieces, brought in by persons we put in search, and many of them are slaty and earthy; but what I send you, is sufficient, I hope, to show that there are good coal beds connected with these. I do not exactly know the site of this deposit; but I believe it has the advantage of being within reach of navigable nullahs; it is on a nullah falling into the *Jumuna*, a river which divides *Cachar* from *Assam*, and joins the *Kopili*, the *Kalung*, (a branch of the *Brahmaputra*,) and other streams entering the *Brahmaputra*, a little above *Gowahatti*. This will be a most convenient site whence to draw supplies of coals, if the quality turns out suitable for steamers, whenever there be occasion for sending any in this direction. It now becomes almost certain that we shall find very large supplies of this invaluable mineral on the south bank of the *Brahmaputra*; we know already of four places where coal has been found, viz. 1st, under the *Caribári* hills; 2nd, that of the *Dharpur Pergunnah*; 3rd, on the *Suffry*, a nullah near the *Borhat* salt formation, and 4th, on the *Noa Dihing*, in the *Singpho* district, south of *Sadiya*. We may besides of course confidently expect to find coal on many intermediate spots, when we come to be better acquainted with the province.

NOTE.—The three specimens of Assamese coal, received with the above note, turn out to be of very respectable quality; they are rather slaty in fracture, and do not coke; but burn with a rich flame, being very bituminous: on this account they would be very suitable for steam engine fires, though unfit for the forge, or for the smelting furnaces. Analysed in the usual way, they yielded the following ingredients:

	No. 1.	No. 2.	No. 3.
Volatile matter, expelled by coking process,	63.1	56.9	62.8
Carbon, ascertained by incineration of coke,	29.6	31.1	29.0
Earthy residue,	7.3	12.0	8.2
	<hr/>	<hr/>	<hr/>
	100.0	100.0	100.0

The weight of the three coals gives a somewhat different result, No. 2, being the lightest, and consequently the least earthy, of the three.

viz: No. 1. has a specific gravity, 1.226
 2, 1.196
 3, 1.223

J. P.

IV. CARNIVORA.

17. Felis. (Spec. large : No. and character undetermined.)

18. Canis. (Species undetermined.)

19. Hyæna. (Species undetermined.)

20. Amyxodon. (Nob.)

1. *A. Sivalensis*. (Nob.)

Indications of other genera.

V. REPTILIA.

21. Crocodilus.

C. Biforcatus ?

22. Gaviala.

G. Gangetica ?

23. Emys. (Several species undetermined.)

24. (Trionyx. (Several species undetermined.)

VI. PISCES. (Heads, vertebræ, &c. of unknown fishes.)

VII. TESTACEA. (Univalves and bivalves undetermined.)

XIII.—*Note on the Asurhár of the Rájmahal Hills. By Capt. H. TANNER.*

[The following letter has reference to an extract from BUCHANAN'S geological account of the Rájmahal hills, to which the Editor drew attention on the cover of the May number of the Journal, in consequence of a report having reached him that fossil bones had been discovered in the same range of hills towards Burdwan. This present information removes any hopes of meeting with the expected fossils, and may save the trouble of further search ; for reference sake, the passage is here reprinted :

“The other calcareous matter, in mass, is called *asurhár*, or giant's bones. The greatest quantity is found at a place, in the centre of the hills, called *asurni*, or the Female Giant. As the lime, produced from this substance, is whiter and better than that made from the nodules, a great part has been removed. It occupied a space, on the surface of the declivity of a hill, about 40 or 50 yards in length ; and from the bottom of the hill, extended upwards, from ten to forty yards, and seems to have formed a crust from 2 to 3 feet thick, covered by a thin soil, filled with loose masses of stone. It has evidently been fluid, or at least gradually deposited from water, as it has involved many fragments of stone, some earthy matter, and a few univalve shells, of a species with which I am not acquainted, and cannot therefore say, whether they are a marine or land production*. The masses of stone that had been involved vary from the size of the head to that of a walnut, and the *asurhár*, or calcareous tufa, does not adhere very firmly to them ; so that in breaking, the mass being very hard, these nodules are generally shaken out. Near the quarry I saw no rock ; but all the fragments involved, and those under the calcareous matter, are of a dark-coloured siliceous matter. In this place I saw appearances that, in some measure, justify the native name ; for one piece of the *asurhár* contained what had very much the appearance of a flat bone, with a process projecting at one end. I also observed a curious impression, a semi-cylinder, about three inches in diameter, and 18 inches long, not quite straight, and exposed to view, as if, by breaking the rock, the other half of the cylinder had been removed. The surface of the cavity was wrinkled with transverse folds, like the inside of an intestine, but may have possibly been the bark of a tree, although I have seen no bark with such wrinkles ; I rather suppose that this has been the impression of some marine animal. The greater part of this *asurhár*, as I have said, has been burned by Mr. CHRISTIAN, a Polish merchant of Monghyr, who, I am told, owing

* I have since found these shells in the rivers of Gaya.

to the expense of carriage, did not find it advantageous. His overseer gave me a piece of it crystallized, which differs, in some respect, from any calcareous spar that I have seen. I myself found no crystallized matter in any of the *asurhár*. This substance is also found close adjoining to the hot sources of the Angjana river, and by the natives has been wrought to a trifling extent. It is in a stratum, about a foot thick, lying on loose siliceous stones, to which it adheres, and is covered by about a foot of soil, mixed with stones. So far as I saw, it contained no animal *exuvia*.

"On the stones, through which the hot-water issues, both of the sources of the Angjana, and at Bhimbandh, there adheres a tufaceous matter, so like this *asurhár* that I at first sight concluded it to be the same; but on trial, I found that it does not effervesce with the nitric or muriatic acids, and is probably of a siliceous nature."—ED.]

My attention was first directed to *Asurni* by the Superintendent of Buildings having requested me to search for limestone in the neighbouring hills. I heard from natives, that Captain (late General) GARSTIN had procured lime from that place to build the Government granary at Patna.

I proceeded there in November, 1819, and encamped 12 days in the valley.

Natives who had worked for General GARSTIN, and subsequently for Mr. CHRISTIAN, described the lime rock as a large mass at the foot of the hill, of considerable height, inclining over to the north, so as to afford shelter when it rained; and when it was quarried, they placed fire underneath, to heat the stone, and then poured water from above, to burst it.

I conceived some remains of a stratum might be found, and had a trench excavated some distance along the base of the hills, another intersecting it up the slope, but could only find incrustations on the fragments of siliceous stones, some nodules imbedded in the scanty soil, a few of them crystallized; but all were indiscriminately called *asurhár* by the natives, without reference to form, merely from the porous texture.

I found a superior sort of tufa at various places in the valley, and remarked that each lump formed invariably, as if from percolation, round the roots of the *sal-hur* tree, thickest near the tree and thin towards the edges, and in many instances extending along the thin roots, assuming a cylindrical form, but not perfectly round: these were also called *asurhár*.

The lime from this species of tufa was considered so good, that the Superintendent wished for a large quantity, for the purpose of white-washing, but the cost of transit across the hills was too great.

I availed myself of the "*Jellinghí*," passing the other day, to send you a sample of actynolite; it is only a few inches long, but generally the pieces are two or three feet long and a foot thick, standing vertically on each other to a great height, presenting a precipice of columns, near to *Asurni*.

XIV.—*Extract from a Meteorological Journal kept at Kandy, Island of Ceylon. By Captain ORD, R. E.*

Date.	Thermometric Range.							Rain-guage.	
	Monthly Range.		Greatest Range in 24 hours.		Least Range in 24 hours.		Mean Temp.	Rain fallen.	Fallen in 24 hours.
1833 and 1834.	Max. and Min.	Range	Max. and Min.	Range	Max. and Min.	Range		In the month Inches.	Max. and Min.
Nov. ..	81° 25° 66° 5	14° 75	80° 5° 67°	13° 5	74° 5° 69°	5° 5	72°	9° 3	1° 6° 0.
Dec.....	79° 5° 62° 5	17°	79° 5° 62° 5	17°	72° 5° 69° 5	3°	72° 3	7° 65	1° 75° 0.
Jan.....	82° 59°	23°	81° 59°	22°	73° 5° 69° 5	4°	71° 8	7° 0	3° 8° 0.
Feb.....	85° 59°	26°	81° 59°	22°	75° 5° 70°	5° 5	73° 5	1° 75	1° 4° 0.
Mar. ..	88° 59°	29°	88° 65°	23°	81° 71°	10°	75° 5	6° 25	1° 8° 0.
Apr.....	84° 5° 61°	23° 5	81° 61°	20°	76° 70°	6°	73° 3	6° 25	1° 95° 0.
May. ..	85° 65°	20°	83° 5° 65°	18° 5	75° 5° 74°	1° 5	76° 3	2°	1° 0° 0.
June. ..	81° 69°	12°	80° 70°	10°	74° 71°	3°	73° 8	10°	2° 0.
July. ..	78° 5° 69°	9° 5	78° 69° 5	8° 5	73° 5° 70° 5	3°	72° 7	8° 7	1° 8° 0.
Aug. ..	81° 5° 66°	15° 5	81° 5° 66°	15° 5	73° 70°	3°	72° 3	8° 45	2° 8° 0.
Sept. ..	82° 5° 66° 5	16°	81° 5° 68° 5	13°	75° 5° 69° 5	6°	73° 1	4° 0	8° 0°
Oct.....	85° 63° 5	21° 5	85° 64° 5	20° 5	75° 70°	5°	72° 7	7° 1	0° 9° 0°

N. B. Highest range in the shade, 88°. Lowest, 59°. Mean Temp. of the year—73° 3. Total quantity of Rain—inches, 78° 6

Remarks.—Kandy is situated in a mountainous district, in Lat. N. 7° 18'; --Long. 80° 49', and at an elevation of about 1680 ft. above the level of the sea. It is so surrounded by high hills, as to render both the direction and force of the wind very difficult to be obtained—but it is strongly affected by both monsoons.

XV.—*Postscript to the Account of the Wild Goat of Nipál, printed in the September No. of the Journal, page 490. By B. H. HODGSON, Esq.*

Carefully as I thought my account of the wild goat of Nipál, recently published by you, was executed, I find that there is one material error in it, viz. the statement that the species has only two teats or mammæ. A recent dissection of a fine male led to the notice of the fact, that there are four teats, which fact was confirmed by the examination of two live females. There can, therefore, be no question that this species of goat has four teats: and the circumstance is so remarkable, that I propose to substitute the name *Quadrimammis*, or four-teated; for the popular name of *Jhárál* under which I described it. Deer are distinguished by four teats; goats and sheep, heretofore, by two; the intermediate genus, antelope, by four or two, in the several species. *Capra Quadrimammis vel Jhárál*, by its four teats, offers a singular and unique approximation (in this genus) to *cervus*; and another proof that the infinite variety of nature cannot be designated by our artificial signs and peremptory divisions. *Antelope, capra*, and *ovis*, how shall we contradistinguish them? solid cored horns, in the first, is no unerring mark: and now we have a species of the second, and a *beardless* species too, abandoning his congeners to tally himself with *cervus*—quoad, the number of mammæ.

XVI.—*Analysis of Raw Silk. By Mr. J. W. LAIDLAY.*

A. A hundred grains of yellow raw silk were digested in moderately strong alcohol, which soon assumed a fine orange tint. At the end of some days, much colour remaining unremoved, heat was applied, and the solution gently boiled. The alcohol was then decanted, and successive portions of the same solvent were employed, till the silk appeared perfectly decolorized. The solutions were then reduced to a moderate compass by distillation, and on cooling deposited a feeble cloudy precipitate, which subsided slowly. The clear fluid being decanted, and evaporated at a gentle heat to dryness, left a deep orange brown mass, which weighed 0.9 grains. This substance was adhesive, fusible, scarcely, if at all, soluble in water, but readily so in alcohol, to which in small proportions it communicated a fine orange tint. A concentrated solution deposits on cooling a vast number of minute shining crystals, which subside to the bottom in the form of a brilliant orange-brown powder. When this precipita-

tion has ceased, the solution lets fall, by spontaneous evaporation, a few filamentous bunches of a white colour, and apparently fatty nature; but in quantity too small for more particular examination.

B. The flocculent precipitate above mentioned, being collected and dried, weighed 0.1. It had the consistency, fusibility, and other sensible properties of wax.

C. The silk, still perfectly elastic, was now transferred to a deep silver vessel, and boiled with successive portions of distilled water as long as any sensible action was produced. A colourless, opalescent solution was obtained. It was frothy and viscid; and exhibited scarce any tendency to deposit the particles it held in suspension. A solution of bi-chloride of mercury, cautiously dropped from a graduated tube, threw down a bulky coagulum, which after boiling, became much condensed, and permitted the easy decantation of the clear fluid. This precipitate, well washed and dried, weighed (deducting 1.4 grains, the amount of metallic salt employed), 8.9 grains. It had all the well known characteristics of albumen.

D. The clear fluid decanted in process C. being evaporated to dryness in a steam bath, left a nearly colourless, transparent, brittle mass, resembling gum. It weighed 13.0 grains, and had a tendency to soften, from the presence of a small quantity of deliquescent salts. It dissolved readily in water, from which neither the bi-chloride nor tan threw it down. It exhibited no tendency to gelatinize, however concentrated; and was copiously precipitated by sub-acetate of lead.

E. Alcohol now took but a feeble tinge from the silk, which still retained a little harshness. A very dilute solution of caustic potash was accordingly exhibited; and after a few hours digestion, was poured off, exactly neutralized with muriatic acid, and treated with the bi-chloride as in process C. The precipitate of albumen thus obtained weighed 0.4 grains.

F. Finally, the silky fibre, which had now attained its full lustre and flexibility, weighed 76.5; exhibiting a loss of 0.6 upon the total, attributable to hygrometric moisture; the whole of the products being dried at a steam heat immediately before weighment. The following are the results of the analysis:

A. Resinous colouring matter, and white filamentous substance, . . .	0.9
B. Wax,	0.1
C. and E. Albumen,	8.9
D. Mucus,	13.0
F. Bleached fibre,	76.5
F. Hygrometric moisture,	0.6
	<hr/>
	Grains, 100.0

An analysis of white silk gave identical products; and in amount differing only fractionally from the above; except in the particular of the resinous colouring matter, which was indeed present, but in a very much smaller proportion. It is probable that the varieties of colour observable in cocoons, the yellow, the orange, the buff, the white and the greenish hues, depend only upon the greater or less amount of this resin in the fibre.

XVII.—EXTRACTS FROM CORRESPONDENCE.

1. *Note regarding the Bhilsa Monument. By Dr. SPILSBURY.*

With respect to the Bhilsa monument, I see Mr. HODGSON also agrees in thinking it similar to the Manikyāla tope, and which I have been at you so long about, and for which reason I sent you a selected drawing. With regard to apartments within, none exist. When Mr. MADDOCK was Political Agent at Bhopal, he obtained leave from that Government to dig into it, and I visited it soon after, (in December, 1822,) when Captain JOHNSON, his Assistant, had completely opened it from the top to I think about 30 feet below the level, and to what he considered, the bottom of the foundations, and found the whole solid brick-work, without any appearance of recess or open space of any kind. FELL should have stated that the gate-ways are four, three of which are standing, the fourth having been thrown down by an earthquake, the whole of which is strewed on the ground, and that in no long time, another will follow: it would be well worth an amateur's while to take copies of the compartments, the sculpture of which is like nothing you see in India. There is another style of sculpture that I have seen from Kallinjer and Adjeegurb down as far south as I have been—some of them magnificent temples and ruins, always indecent, frequently highly obscene—sculpture that I have never remarked in any part of the provinces: to what era does it belong?

2. *Note on the Sárnath Building, by the Baron Hugel.*

Je joins quelques mots à ma lettre pour vous faire quelques remarques sur le Sarnath et le Atala Mosjid à Juanpur.

Le Sarnath, ce Dagoba (ou Dhagoba) des Buddhistes, ce qui par parenthese peut être l'origine du nom Pagoda par l'anagram des syllables, est d'une forme inusitée en Ceylon ou parmi quelques centaines qui j'y ai vu depuis les petits près de Colombo, jusqu'aux immenses d'Anaradjapura, toutes différentes l'une de l'autre, aucune n'a la forme du Sarnath. Tout ceux de Ceylon ont un second bâtiment sur le premier: mais celui-ci dans son dessein ne forme que l'accessoire, comme la lanterne à la coupole moderne, pendant que le Sarnath a dans son dessein le bâtiment d'en haut pour objet principal; pour lequel la partie d'en bas n'est que le fondement, la base: ces Dagobas sont toujours batis sur un quarré qui (chez les petits, et le Sarnath est de ce nombre) ne forme que partie d'un plus grand quarré, qui contient l'entrée et une Vihare: ces deux quarrés sont visibles dans les debris du Sarnath.

La relique sur la quelle l'édifice est bati se trouve toujours au niveau du premier quarré: mais pas toujours au milieu. L'Atala Mosjid à Juanpur cet decedant un ancien Agar, je crois que c'est le nom, ou maison d'école Buddhu: une de ce genre se trouve à Bijapur, et plusieurs en Ceylon, dont la plus grande et celle mentionnée par TURNER dans son Epitome, nommé dans les aucieunes cartes de Ceylon, 1000 colonnes. Celle de Juanpur contient 1060 colonnes ou plutôt pilastres détachés, (colonnes quarrées est une fausse dénomination :) J'ai cherché mais en vain de trouver une inscription sur ces colonnes à Juanpur, mais je suis sure qu'une personne avec plus de tems que j'avois moimême finirait par en

trouver une. Dans tous les autres édifices à Juanpur se trouvent des fragmens de monumens Buddhistes. Quel était l'ancien nom de cette ville?

3. Note on the occurrence of the Bauddha Formula.

Turning by accident to the copy of the inscription on an image of Buddha, found along with two urns in the excavations at Sarnath, made in the year 1798, and described by J. DUNCAN in the 2nd volume of the Asiatic Researches, I was much pleased to discover the identical sentence "*ye dharma hétu prabhava, &c.*" about which so much discussion has lately taken place, occupying the two bottom lines of the page. They are disguised by several very gross errors of the copyist, and it is therefore not surprising that no attempt should have been made by WILFORD, who alludes several times in his essay to the other part of the inscription, or by other Sanscrit scholars, to read it; the lines are thus given:

खर्कहेतु प्रकरोहेतुं तेषां तथाफले ह्यवदत्
तेषां च यन्निरोधार्थं तां दी महा चमणः।

By comparing this with the version given in page 137, its real accordance will be at once perceived through the disguise of numerous blunders.—J. P.

4. Extracts from a Journal of a Residence, and during several Journeys, in the Province of Behar, in the years 1831 to 1834. By Mr. J. STEPHENSON.

Lunar Iris.

I had the pleasure of observing this beautiful phenomenon two miles to the east of Singhea in Tirthut, at 5 A. M. on the 4th of August, 1831. It appeared in the eastern part of the sky, the moon being in her last quarter, and only a few degrees about the western horizon. The prismatic colours were distinctly developed, and the arch perfect, though not so intense as those generally seen in the solar iris. The radius of the arch appeared also less than the one formed by the sun. It remained distinctly visible for the space of 15 minutes; after which it gradually lost its radiancy, and disappeared. The morning was cloudy, with light showers of rain, and the temperature 85° of Fahrenheit.

I have reason to observe that this phenomenon is not of frequent occurrence; for this is only the second one I have seen during my life-time.

Frost Rind, January 16th, 1832.

The native thatched butts in the village of Singhea in Tirthut were this morning covered white with a frost rind, although the thermometer did not indicate a lower temperature than 46° of Fahrenheit, with light airs of wind from the west.

Beautiful Meteor observed near Singhea, Tirthut, April 11th, 1832.

At four hours 45 minutes A. M., and at day-break, observed a meteor in the form of a globular ball of fire, which passed through the air, from west to east, in a horizontal direction, and with a motion moderately rapid. Its size appeared to be about a foot in diameter, having a fiery train of the most splendid brilliancy, apparently many yards long. It illuminated the country as far as the eye could reach, and remained visible for five seconds, after which it exploded like a rocket throwing off numerous corruscations of intense light; but without any report or noise of any kind. Its apparent elevation inconsiderable.

Another beautiful Meteor observed at the same village on the 20th of May, 1832.

At 6 hours 40 minutes P. M. a large pear-shaped meteor was observed shooting very rapid in a horizontal position, and in a direction from N. to S. Nothing could exceed the brilliant mixture of green, tinged with blue colours, exhibited during its rapid progress. It left a luminous train of great length behind, and remained visible about three seconds, then disappeared in the southern horizon, without exhibiting any signs of exploding.

Remarkable Phenomenon seen opposite Singhea, in Tirthut, July 15th, 1833.

This evening, during a thin shower of rain, I observed on the opposite side of the great river Gandak, at the distance of two miles, the phenomenon called by the natives "*Rāja Harchand ka Pura*." An aerial city appeared, with its

palaces, temples, houses, spires, columns, &c. forming altogether a very beautiful spectral appearance, which remained visible for the space of 10 minutes; after which, it began to alter its appearance, becoming faint and dilapidated, till it gradually disappeared altogether with the passing shower. This phenomenon I do not remember to have ever before seen. It seems to differ from what is called the *Fata Morgana* in Italy, and I think, partakes more of the nature of what is called the *French Mirage*, for I observed no reflection on the intervening water; but it was considerably elevated above the west bank of the river, directly above a grove of mango trees, which were not seen during the shower of rain, and I suppose caused this very singular appearance by the refraction, or reflection of the atmospheric air, of different densities, surrounding the grove.

Parhelia or Mock Suns, 19th May, 1834.

About 5 hours 30 minutes P. M., I observed the most singular and beautiful phenomenon I ever beheld. A dense black cloud, (cumulus,) of a large size, formed itself to the west of *Singha*. The sun had just retired behind it, when suddenly there appeared on the upper edge of the cloud four *parhelia*, or *mock suns*, exhibiting the most brilliant colours of green, blue, and scarlet, intermingled, which neither pen nor pencil could describe. The upper part of the cloud was fringed with *radii*, or small innumerable black rays, shooting upwards with a slow but perceptible motion.

To heighten the already beautiful effect, in a few minutes the sun burst through an aperture in the middle of the cloud, with a splendour past description. This phenomenon remained visible for the space of ten minutes, when it gradually disappeared, and heavy lightning succeeded, flashing its way towards the south-east.

Sand Columns.

During my travels in *Behar*, I had frequent occasion to notice this phenomenon on the desert sand-banks of the Ganges. The first I ever saw was between *Rajmahal* and *Sichigully*, on the 23rd of November, 1830. Several sand columns formed from twenty to sixty feet high, having a whirling motion similar to a water spout at sea. They passed at about half a mile distance, and remained visible for five minutes.

Feb. 10th, 1833. Observed several sand columns on the large island between *Bar* and *Mowah*. The whirling motion was very perceptible, and they rose in a perpendicular column to more than 100 feet. They only remained whole a few minutes, when they gave way at the base, and dispersed in a cloud of sand.

Feb. 25th, 1833. On the sands formed by the confluence of the river Soane with the Ganges, we observed two large sand columns, which reared their heads to a great height in the atmosphere, with an obvious whirling motion. The apparent diameter of each seemed to be twelve feet. They remained perfect for the space of several minutes, and then gradually dispersed, forming a cloud of sand, which remained visible for a considerable time, till wafted away to the east, by a slight breeze of wind from the west, which just ruffled the surface of the Ganges.

These sand columns have not passed unnoticed by the natives, who call them *Bundoah*. I was told by a respectable native that instances have been known of people being caught in the whirl, and either killed, or severely hurt by their force. I have to notice that on every instance that I have observed this phenomenon, the sky was clear, and not a cloud to be seen.

BRUCE was one of the first to describe these columns in his travels to discover the source of the Nile. That celebrated traveller describes them as tremendous, overwhelming, and destroying whole caravans of men and cattle.

In BURNES' travels, I find mention made of them under the name of whirlwinds: "In this neighbourhood (meaning the desert), and more particularly while on the banks of the river, we witnessed a constant succession of whirlwinds, that raised the dust to a great height, and moved over the plain like water-spouts at sea. In India, these phenomena are familiarly known by the name of *devils*; where they sometimes unroof a house; but I had not seen them in that country either of such size or frequency as now prevailed in the Turkman desert. They appeared to rise from gusts of wind, for the air itself was not disturbed, but by the usual north wind that blows steadily in this desert."

I dare not venture an opinion with reference to the cause of this phenomenon ; but in all probability it is the same that creates water-spouts at sea. However, when a sufficient number of well-described facts are made known, some future Sir ISAAC NEWTON may collect and form a theory from them upon a firm basis, and if this notice contribute but an iota towards it, I am well rewarded.

Mirage seen on the 15th Dec. 1832, near Jandaka in Tirhut.

A little to the east of *Barbatta Ghât*, on the *Byah Nullah*, is a wide extended plain, without trees or jungle of any kind ; nothing of vegetation is to be seen, except a stunted species of grass, which serves to feed numerous herds of cattle, that seem to thrive on this sterile waste : patches of saline matter are here and there to be seen white with efflorescence. On the above day, I travelled across this plain, and at 3 P. M., observed the phenomenon of *Mirage*. Every object in sight was rendered five or six times its ordinary size. The men and cattle appeared gigantic spectres, stalking about in the distance ; a few of them appeared as if walking on *stilts*, while some of the buffaloes' heads seemed larger than their bodies. A few were elevated to such a height, that their legs appeared like the trunks of palm trees. These distortions continued to change as the objects moved about, to such a degree, that the men and cattle changed their shapes every moment like shadowy spectres. A transparent bluish kind of vapour could now and then be seen when stooping down, and looking towards the horizon, and having an undulatory motion, which, I have no doubt, caused this phenomenon. It is, however, not common, for my servants, when asked about it, looked grave, and their countenances expressed more of fear than curiosity ; while at the same time, they did not like to talk or say any thing on the subject. They, however, stated, that it was something not good, and that "*many people would die after seeing it.*" I could not even prevail on them to stay to witness its disappearance.

This plain is bounded on the east by a swampy j'hîl of considerable extent. Could the blue vapour which I distinctly saw, be what is generally called *Malaria*? If so, I have certainly seen it, though "in a questionable shape," contrary to the opinions of many who deem it impalpable and invisible ; at first I attributed the fears of my servants to superstition, but I have subsequently thought that they have reason to fear it, especially if the appearance was really caused by *Malaria*, which is probable ; for a great mortality of the people in the neighbouring villages took place in a few days after I had returned from my journey.

The *Mirage* representing water I have so often observed, that I thought it too common to notice.

5. *Range of the Barometer and Thermometer at Port Louis in the Mauritius in 1828, by LISLET GEOFFROY, Cor. Roy. Ac. Sc. of the French Institute, for the 2nd Vol. Roy. As. Soc. Trans.*

Month.	Barometer.				Thermometer.				Hygrometer.		Rain.		Tdr.	Wind.
	Max.	Med.	Min.	Var. from mean.	Max.	Med.	Min.	Var. from mean.	Max.	Min.	Inch.	Days.		
Jan	29.85	29.75	29.65	-.04	89	82	74	+4	96.°	78.0	2.87	14	6	N. N. E.
Feb	29.74	29.64	29.54	-.15	89	85	81	+7	96.3	78.0	5.00	13	2	N. E.
March...	29.74	29.34	29.14	-.45	87	84	80	+6	101.0	78.0	13.07	17	3	N. E.
April...	29.86	29.46	29.16	-.33	83	77	72	-1	95.0	75.1	6.63	6	4	S. E. S. E.
May, ..	30.17	29.87	29.77	+.08	80	76	72	-2	95.0	73.0	0.67	5	1	S. E.
June, ..	29.87	29.86	29.77	+.07	80	75	71	-3	94.0	76.0	0.66	7	0	S. E. S.
July, ...	29.98	28.98	28.98	+.19	77	73	70	-5	94.0	79.0	0.25	6	0	E.
Aug. ...	29.98	29.98	29.88	+.19	77	72	68	-6	95.0	77.3	2.13	11	1	S. E.
Sept....	29.97	29.97	29.87	+.18	80	76	73	-2	10.3	78.1	0.27	2	0	S. E.
Oct....	30.06	29.96	29.96	+.18	82	77	72	-1	97.3	76.0	0.21	6	0	E.
Nov.....	29.95	29.86	29.86	+.07	83	79	75	+1	92.3	76.0	1.29	5	2	variable.
Dec...	29.90	29.85	29.85	+.06	86	83	77	+5	92.3	76.0	0.44	12	3	E.
Mean...	29.793				78.2						33.49	104	22	

In adding this to the number of Meteorological abstracts published in our Journal, we have corrected several obvious mistakes in the decimals of the original.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of December, 1835.

Day of the Month.	Observations at 10 A. M.										Observations at 4 P. M.										Register Thermometer Extremes.		Wind.		Weather.	
	Standard Barometer, at 32°.	Wet Baro- meter, at 32°.	Avg. Ten. deduced.	Thermome- ter in air.	Diff. or M. T. Depress.	Leslie's Dif.	Hair Hy- grometer.	Standard Bar. at 32°.	Wet Bar. at 32°.	Avg. Ten. deduced.	Thermome- ter in air.	Diff. or M. T. Depress.	Leslie's Dif.	Hair Hy- grometer.	Cold on roof.	Heat insun.	Rain.	Morning.	10 A. M.	4 P. M.	Day-light.	10 A. M.	4 P. M.			
1	29.040	29.264	70.785	72.1	7.4	9	81	.945	.110	.835	73.7	9.2	8.7	82	54.0	83.5		n.	N.	NW.	clear.	fine.				
2	.026	.295	73.1	71.0	9.0	7.2	86	.906	.098	.808	73.1	11.8	8.7	78	54.3	80.7		n.	n.	nw.	do	do				
3	.040	.347	69.3	69.1	8.4	6.2	81	.926	.164	.762	71.4	12.4	11.7	71	53.4	79.2		nw.	n.	nw.	do	do				
4	.087	.394	68.3	6.2	8.1	7.6	84	.933	.237	.746	71.0	10.1	9.2	77	49.1	79.5		w.	n.	n.	do	do				
5	.122	.436	.686	68.9	6.3	6.6	86	.997	.246	.751	71.1	8.0	7.8	82	52.0	81.8		o.	n.	n.	do	do				
6	.105				6.6	5.2	90	.990				10.4			53.8	79.2		w.	W.	n.	do	do				
7	.076	.365	71.0	69.4	6.2	5.0	74	.960	.166	.764	71.4	7.3	6.8	86	54.0	82.8		o.	n.	n.	hazy.	do				
8	.074	.364	71.0	69.6	6.3	5.9	88	.960	.163	.762	72.5	8.6	8.4	81	55.0	82.6		o.	n.	n.	do	do				
9	.046	.344	70.2	69.4	7.1	6.0	83	.934	.166	.768	72.6	8.2	7.7	83	53.2	81.5		o.	n.	n.	do	do				
10	.046	.336	70.1	69.8	7.3	6.7	87	.958	.196	.762	71.7	8.0	7.7	84	53.7	83.2		o.	n.	n.	do	do				
11	.086	.378	70.8	69.7	7.0	6.3	89	.966	.196	.764	71.4	7.6	7.2	85	52.8	84.8		n.	n.	n.	do	do				
12	.034	.397	.697	69.1	5.1	4.6	83	.911	.198	.756	71.1	10.3	8.1	81	50.3	84.0		o.	n.	n.	do	do				
13	.062				4.8	4.6	92	.946	.188	.758	71.3	6.3	5.6	89	52.0	85.5		o.	n.	n.	do	do				
14	.042	.339	70.3	69.3	5.9	4.6	92	.946	.188	.758	71.3	6.3	5.6	89	52.0	85.5		o.	n.	n.	haze.	do				
15	.047	.298	74.0	70.3	5.6	5.1	92	.938	.147	.791	72.0	7.1	6.6	86	53.4	86.2		o.	n.	n.	clear.	do				
16	.070	.342	.728	69.7	4.7	4.4	94	.949	.124	.825	73.0	7.6	7.0	86	53.4	84.3		o.	n.	n.	do	do				
17	.040	.298	.751	70.6	6.2	5.2	91	.944	.147	.797	72.3	7.9	8.0	81	53.7	83.8		o.	n.	n.	do	do				
18	.056	.334	.722	70.0	5.7	5.1	91	.910	.118	.792	72.7	9.9	9.7	78	54.2	84.8		o.	W.	w.	do	do				
19	.013	.266	.747	70.7	7.2	7.2	85	.900	.110	.762	71.9	8.3	8.7	79	53.2	86.5		ne.	n.	n.	do	do				
20	.007				7.2			.900				10.4			53.4	83.8		o.	n.	n.	do	do				
21	.008	.268	.740	70.5	5.5	5.2	92	.899	.096	.802	73.0	8.7	8.4	83	53.4	83.8		o.	n.	n.	do	do				
22	.009	.247	.752	70.7	5.4	5.2	95	.890	.047	.853	74.2	9.2	8.9	82	54.7	86.8		o.	W.	w.	do	do				
23	.033	.270	.763	71.5	5.2	5.3	92	.924	.070	.854	74.3	8.7	8.1	85	55.2	85.6		o.	W.	w.	do	do				
24	.058	.196	.719		4.6	4.0	95	.967	.034	.832	74.6	6.9	7.4	83	55.6	89.1		o.	n.	n.	do	do				
25	.054				5.1			.975				11.5			56.7	87.8		o.	W.	n.	do	do				
26	.068	.140	.828	73.0	3.9	4.0	91	.846	.940	.906	75.9	6.6	6.1	89	58.7	83.0		o.	W.	n.	do	do				
27	.005				2.9			.884				9.3			58.8	75.4		E.	W.	sw.	do	do				
28	.019	.396	.623	66.4	6.8	5.7	87	.897	.196	.701	68.9	10.0	9.4	76	49.2	72.2		E.	n.	n.	cloudy.	do				
29	.016	.347	.669	67.6	7.8	8.0	79	.883	.194	.703	69.1	11.2	11.0	70	47.0	70.8		NW.	n.	n.	clear.	do				
30	.977	.328	.649	67.1	6.0	6.2	86	.940	.147	.736	70.1	9.9	9.5	73	47.5	80.7		ne.	n.	n.	do	do				
31	.040	.376	.664	68.1	5.4	5.4	89	.198		.770	70.4	6.6	6.1	88	52.2	83.2		ne.	e.	n.	do	do				
Mean,	30.030	29.312	0.716	69.8	6.1	5.	88	.927	.143	0.707	72.0	8.9	8.2	82	53.3	82.8	0.05									

Captain HENNING, of the Windsor, has afforded us another opportunity of comparison with the barometer of the Royal Society at Somerset House. This gentleman's marine barometer, compared with ours last year, was found on arrival in London to stand a little lower than before the previous voyage. Col. SYKES's memorandum made it in June last, '120 lower than the Roy. Soc. standard at 32°. It is now found to be 0.102 below our standard at 32°, making ours—918 of the R. S. Barom. (See Met. Reg. [Nov. 1834.]

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